



This is a digital copy of a book that was preserved for generations on library shelves before it was carefully scanned by Google as part of a project to make the world's books discoverable online.

It has survived long enough for the copyright to expire and the book to enter the public domain. A public domain book is one that was never subject to copyright or whose legal copyright term has expired. Whether a book is in the public domain may vary country to country. Public domain books are our gateways to the past, representing a wealth of history, culture and knowledge that's often difficult to discover.

Marks, notations and other marginalia present in the original volume will appear in this file - a reminder of this book's long journey from the publisher to a library and finally to you.

Usage guidelines

Google is proud to partner with libraries to digitize public domain materials and make them widely accessible. Public domain books belong to the public and we are merely their custodians. Nevertheless, this work is expensive, so in order to keep providing this resource, we have taken steps to prevent abuse by commercial parties, including placing technical restrictions on automated querying.

We also ask that you:

- + *Make non-commercial use of the files* We designed Google Book Search for use by individuals, and we request that you use these files for personal, non-commercial purposes.
- + *Refrain from automated querying* Do not send automated queries of any sort to Google's system: If you are conducting research on machine translation, optical character recognition or other areas where access to a large amount of text is helpful, please contact us. We encourage the use of public domain materials for these purposes and may be able to help.
- + *Maintain attribution* The Google "watermark" you see on each file is essential for informing people about this project and helping them find additional materials through Google Book Search. Please do not remove it.
- + *Keep it legal* Whatever your use, remember that you are responsible for ensuring that what you are doing is legal. Do not assume that just because we believe a book is in the public domain for users in the United States, that the work is also in the public domain for users in other countries. Whether a book is still in copyright varies from country to country, and we can't offer guidance on whether any specific use of any specific book is allowed. Please do not assume that a book's appearance in Google Book Search means it can be used in any manner anywhere in the world. Copyright infringement liability can be quite severe.

About Google Book Search

Google's mission is to organize the world's information and to make it universally accessible and useful. Google Book Search helps readers discover the world's books while helping authors and publishers reach new audiences. You can search through the full text of this book on the web at <http://books.google.com/>



3 3433 06640538 6

5765
Presented by

Lysander Salmon Richards

to the

New York Public Library



~~BREAKING UP~~

FOR THE

Birth, Development and Death of the Earth
and its Satellite in Story.

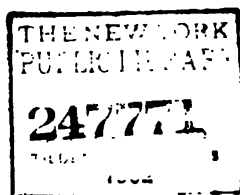
By Lysander Salmon Richards

Author of "Beginning and End of Man," "Vocophy," etc.

BOSTON:

J. E. FARWELL & Co., PRINTERS.

1896.



[COPYRIGHT SECURED BY LYSANDER S. RICHARDS,
WASHINGTON, D. C.]

INTRODUCTION.

Assuming 100 the age or epoch of our planet, we will put its present epoch (the nineteenth century) at 35 and the preceding epoch with which we begin our first book, from 1 to 25. The epoch with which we begin our second book is the 50th Epoch, our third book the 75th Epoch and the last, the Breaking Up, the 100th Epoch.

L. S. RICHARDS.

Marshfield Hills, Mass., U. S. A.



FIRST BOOK



CHAPTER I.

Upon a planet of Sirius — the Dog-star—lived the subject of our story. Like the inhabitants of the Earth, he lived and died, and wandered through space with angelic flight. Worlds have been born and passed into maturity since he left the mortal. He goes here and goes there, and from whence he comes and whither he goes none can tell. How vast his experience! The earth was not ushered into space when he took his flight above, and the Sun had no separate existence. With this introduction I will leave him to tell the people of the earth his own story :—

“Emanating from a planet whose sun is some three hundred times larger than the earth’s sun, a largeness of view is but the natural outgrowth of its inhabitant. My birth is of no account, as I had no recollection of it. Sufficient is it to relate what I know from my own knowledge and observation. Should I count the years of my mortal life, you would fail to understand it; for the time occupied in our planet travelling in its orbit, or performing the

revolution around Sirius, our sun, is equal to many of the years known upon the earth—that is to say, the time occupied in the revolution of the earth around the sun is known as its year, while the time occupied by our own planet in performing its revolution around its sun takes many times as long.

“As to the mode of life led upon our planet, it is useless to attempt to explain; for life there, is in some respects so different from that upon the earth that it is not in the power of any being to interpret it to other worlds. Sufficient is it to know that our first known existence, our development and death, came to pass on the said planet; and millions of others there passed through the same experience. One other important event I nearly forgot to mention: people there have the misfortune, or good fortune, to be united in marriage as upon the earth. Love is common property; but I failed to gain its twofold possession, and died an old bachelor—to gain it in ‘the hereafter,’ as the sequel will show. Liberated from the flesh, our soul winged its way through the interplanetary space. Not far away did we wander; for on the planet which gave us birth, friends and pleasures still attracted us, and when these passed away distance was of but little moment, and the time occupied in travelling through an immeasurable space comparatively nothing; for our spirits are as light as the electric spark which passes through the heavy atmosphere surrounding the earth at the velocity of two hundred thousand miles a second, or around that planet eight times in a second;

hence a million of miles would be but the work of five seconds. It can well be imagined, then, though the solar system to which the earth belongs in round numbers is some twenty million millions of miles from my planet home—a distance so great that light, travelling at the rate of 181,500 miles a second, or around the earth a little over seven times a second, would occupy about twenty-two years in reaching it; or, to make the distance between our planet homes still more comprehensible, suppose we should bombard your little world, and send from my planet home a ball from the cannon's mouth, though your limbs were elastic enough to stretch to my home and give our quarrelsome inhabitants a fisting for this intrusion, they would cleave your hand from the body; and pain, travelling with the rapidity of sensation in the human system, in informing the brain of the injury, fifteen million of years would elapse before the sensation would reach the grand sensorium and be felt by you upon the earth; should you surrender, and a track be laid, and proposals of peace sent, by a messenger, on an express train running thirty miles an hour, night and day, it would take seventy-two millions of years ere the papers could be laid before the sovereign on our planet, and the conflict settled—it can, I say, be imagined that the astounding rapidity with which a spirit can travel, though it may be no faster than light, yet in a few years can traverse distant spaces, and reach your planet with comparative ease.

We do not travel alone, but always select our

company, and form a band of enterprising, instructive and pleasing associates. With these we take prolonged journeys through the heavens; and, as time and space is of small moment in eternity, we continue until our objects are attained; then homeward we direct our flight. Our band contained eight stirring souls; their names are as follows: Medio, the doctor; Phela, the philosopher; Luolu, the astronomer; Saleola, our lady friend; Watitia, our chemist and geologist; Madame Flaviana, our moralist; Olea, our lady chronicler; and myself (by name, Vandimere) as leader of the band. In the after life, ultimately every being strives for something higher, and draws around him, or is drawn toward, those who are better and wiser. Progress is the end of all.

“Ages ago, when, on one of our prolonged journeys, we came to a sudden halt, Luolu, the astronomer, whose vision was keen, and alive to any cosmical phenomena in the heavens, observed, in the distance, at right angles from the course we were travelling, a cloud-like mass, not cumulus, or like clouds of steam, nor black like the thunder-clouds, but more transparent — so thin, in fact, that stars beyond were seen through it distinctly. ‘That,’ said Luolu, ‘is a nebula.’ ‘Bless your soul!’ said Saleola, ‘what is a nebula?’ ‘My lady,’ replied Luolu, pointing to the mass, ‘look! It is before you, and explains itself. If agreeable, friends, let us tarry awhile and watch this interesting phenomenon. There are some strange agencies at work in

that mass; it is without form, for it is constantly changing; it is like a seething, boiling caldron. See how vast its extent! It occupies some two or three thousand millions of miles in space! Let us approach nearer. Ah! it is separating; the rim has parted, and it assumes the form of a ring!' 'Well,' said Medio, the doctor, a good-natured fellow, 'divorces here, as elsewhere, are not uncommon. Suppose we pass nearer to the scene of parting, and examine more closely the cause of it.'

"They all approached, Medio leading the band and finally outstretching all of us in his flight. He stops; behold, he retreats! 'There's trouble,' said I, 'ahead.' He signals us to halt; again he signals, and we fall back. He reaches us, and when his strength is regained he says: 'Luolu, you said the mass looked like a seething, boiling caldron. You are right; for the nearer I approached it the more it felt like one. The heat escaping was intense. Perdition could not have been hotter, and the wicked, or those who feel and sympathize with them, and cannot find a too-scorching place for such, will not meet a warmer reception than in the regions of that mass. But, my friend, what is the cause of that feeling and touching phenomenon?' Luolu replied: 'That nebula is held in a thin, gaseous, incandescent state, because of the excessive heat it possesses. If the heat should escape it would contract immensely, and eventually become a solid—as solid as the planet from which we sprang. It was because the heat was rapidly escaping from the mass and radiating into

space that you felt it so keenly when nearing its vicinage ; from such masses planets and worlds originate. That ring separating from it is the result of the heat escaping from the outer portion, contraction takes place and separation is inevitable.'

"Having concluded our investigations here, we continued our journey and in due season returned to the region of our planetary home. Ages after, when travelling in the same direction we visited the nebula again, although it had moved a long distance from the spot first found. Said Medio, when it first met his view : 'That is not the nebulous mass we saw on our first journey ; it is not more than one twenty-fifth as large ; it is small compared to that mammoth fellow we first saw.' 'Yes,' said Saleola, 'that's true ; neither did it have any of those big moons yonder "kiting" around it. I can't believe it, can you, Vandimere?' Saleola was a plain, matter-of-fact woman, very sensible, but unpolished, honest, and a very useful member of society ; she would not accept another's say-so unless it came within her line of reason. 'Well,' said I, 'I can believe it if Luolu says it is the same ; for he is an astronomer, and devotes his time in studying such phenomena, and if we are patient I've no doubt that Luolu will satisfy us that we are wrong in our hasty, unstudied conclusions, and that he is right.' Says Luolu : 'You remember when on our first visit to this mass that there was a ring separated from it, on the outer portion. Is the ring in view now?' 'No,' replied the company, 'it is not.' 'Where is

it?' said Luolu. 'Was not the heat found to be escaping rapidly from the ring?' 'I will vouch for it,' replied the doctor. 'Contraction in any form of matter, as you all know,' said Luolu, 'follows when heat escapes. Now in that ring not only did the width and thickness contract, but in the direction of its length, of course, contraction took place, and the result is obvious that the ring must break.' 'Yes,' replied Saleola; 'but where did it go to? Nothing is lost, so where are the pieces?' 'Very true,' said Luolu. 'Do you see yonder globe the farthest from the nebula? There are the pieces collected in one mass; the entire matter constituting the ring we first saw is heaped up in that globe before us. When contraction took place in the ring, resulting in breaking or separating it, the law of attraction or gravitation assumed control and the pieces were attracted towards each other, the larger having a greater attractive force than the smaller.' 'I think you are right,' said Saleola; and all were convinced that his conclusions were wise. 'But,' said I, 'why do we find so many globes around the nebula? There are one, two, three, four, five, six in all, and all scattered in different directions around it, though in the same plane.' 'Ages have passed,' replied Luolu, 'since we journeyed in this direction, and other rings from time to time separated from the nebula mass, the same as the first we discovered. These rings contracted and broke and globes were formed.' 'Let us draw nearer to the remaining portion of the nebula,' I said; and we journeyed on, when the sought-for phenomenon struck our view.

“ Instead of a ring around the nebula, we now saw detached masses scattered here and there around the central mass at equal distances therefrom, proving that a ring had broken : and the same phenomenon followed as described by Luolu, and all were moving with great rapidity in an apparent circle around the central nebula. From time to time the larger patches attracted the smaller, and the number lessened until at last but two or three were visible, and these increased to mammoth size by the absorption of the smaller, when ultimately all combined into one, and before us was a huge, gaseous, vapory globe now known as the planet Earth. Venus and Mercury have since separated from the nebula, and all continue to revolve around the remaining central mass now known as our Sun. This is the story of the Earth's birth and origin.

“ After many years we again journeyed in the direction of the earth and we were interested to see another phenomena connected with its history. It was a ring around the outer edge of the planet, it had separated therefrom, and there was an empty space of many miles between them. It separated from the earth in the same manner as the latter and other planets separated from the central mass, the sun, ages before. The ring was very hot, and so was the earth. In course of years it had spent a large amount of its heat, then it began to break up ; we were approaching it as it reached this stage. There were a dozen or more patches surrounding the vapory planet, and they were being attracted towards each

other. They were revolving all the while with lightning speed around the earth, and it was not long ere they were united in one huge ball and with two motions, one around the earth and the other rotating on its own axis, and this was the birth of the Moon, the earth's attendant and satellite."

CHAPTER II.

We will now pass to the period when the moon had expended a sufficient portion of its heat to solidify, its surface becoming solid. Water had accumulated thereon. Ponds, lakes and seas occupied a large space upon its surface and rivers flowed and emptied their contents into these basins. Mountains lifted their peaks into the azure vault, volcanoes and moonquakes shook the satellite. It breathed, heaved and purged as a living being. It had life and when its prime was reached it evolved life, beings moved about upon the crust as they move upon the earth. Not necessarily the same order of beings as we are accustomed to see upon our planet, but more anon concerning this feature. Let us familiarize ourselves with the surface of the moon and we will not oblige the reader to seek a telescope for observation, but when the moon is full look at it with the unaided eye, or a good opera glass, that we may become acquainted with the lunar landscape and the localities where the inhabitants developed, concerning whom we shall soon make mention in the progress of this work. On the southern portion will be seen a very bright spot, this is Tycho, one of the largest

mountains of the moon. The bright spots are the mountains and elevations and the dark areas are the valleys or seas. They are not seas of water at the present time, but are supposed to be sea bottoms, which ages ago were covered with water and as it is our purpose to return to the era of the moon when they were covered with water we will cling to the old names of seas. On the mountain Tycho referred to there will be seen, by the aid of a large opera glass, light streaks radiating in all directions from the summit; these were thought at one time to be roads, but now they are supposed to be streams of lava that once flowed from the top and hardened in process of time. Most of the mountains were volcanic. Near this mountain a dark space is seen and is called Sea of Moistures and still nearer is the Sea of Clouds. Near the western edge or limb is a greyish spot called the Sea of Crisis. Divided by a long bright spot, there is a large dark space, between the Sea of Crisis and the centre of the moon, called the Sea of Tranquillity. On the southwest portion of this sea is a prolongation called the Sea of Fecundity and another nearer the centre called the Sea of Nectar. Between these two seas there is a bright space, a mountain chain called the Pyrenees. Above the Sea of Tranquillity towards the north is another dark spot called the Sea of Serenity, a prolongation towards the centre of the disk is the Sea of Vapors.

Between the last two seas and the Sea of Rains mentioned above is a bright space, a mountain chain, called the Apennines, and also partly surrounding

the seas just mentioned are seen two other mountain chains called the Alps and the Caucasian range. These three ranges are the most prominent upon the moon. The Carpathian mountains are near the Sea of Rains and Sea of Clouds, and Copernicus, one of the largest annular mountains of the moon, is seen as a prominent bright spot near the Carpathian range. The annular mountains just mentioned, are volcanic, which at the present time show huge craters, large depressions at the summit, in some instances measuring over 100 miles across them, and these innumerable elevations and depressions at the top cover a large extent of the moon's surface, presenting the appearance through an opera glass of a piece of tripe, dotted with depressions and seen in its first or last quarter. But as we are to treat of the satellite at a time when it was peopled with living beings we shall return to the past epoch when the waves from the sea beat upon the shore, and the land was as level and smooth as seen upon the earth in our own day. Notwithstanding the fact that the moon is not thought to be inhabited to-day, from the supposed absence of heat and water upon its surface, it is also unquestionably true that ages ago, beings dwelt there, and it is quite probable that there were men, women and a variety of animals as found upon our planet, for the chemical composition of the moon is similar to that of our own and hence it probably evolved a similar class of beings with this difference: our satellite being only a quarter of the diameter of the earth, the inhabitants were

probably correspondingly small, so that a man upon the moon would measure but about one foot and a half in height. Between the seas I have mentioned and the mountain chains, on the shores, in the valleys and on the foot-hills, we can picture communities of people and dwellings here and there in which to live. The houses were small for these little fellows; a foot and a half in stature did not require a tall house; rooms were only two and a half feet from floor to ceiling and the whole edifice but five or six feet high. Half a dozen rooms were quite sufficient for these Liliputians. Their food must have been similar to ours, but the size of fruit and garden products grown were probably about one-quarter as large, but better and not as coarse. Animals were correspondingly small. Horses about the size of our Shetland ponies and cows as small as a calf a month old. Their diet consisted of animal and vegetable food. Their disposition like ours. They were ambitious and studious, and probably invented all sorts of instruments not omitting philosophical and astronomical. I see them looking at the earth through their refractors and reflectors, and as our planet is so much larger than theirs, in volume, some forty-nine times greater, the objects upon our surface could be seen with more distinctness than we can view objects upon their surface. We see them in those remote ages observing our development, before life even was evolved on our planet, and in that era our earth was much larger than at present, and so was the moon. We have been cooling, and as we cool, diminish in

bulk, so that the distance between our satellite and us was not so great in that age, and consequently the developments here more easily distinguished. The language of the moonites may have been similar to ours, and it may not, very likely not. They may have communicated with each other by signs and not by speech, but for convenience and better understanding we will waive the difference and let them speak and call it English.

CHAPTER III.

On the foot-hills of Mt. Tycho in the southerly part of the moon, we see a portion of the country dotted here and there with settlements. A little farther off and between the Sea of Moisture and Sea of Clouds the settlements represent a denser population. On the foot-hills there are peasants tilling the soil. Their method is different than upon the earth. Their implements are light, and the motion of the laborer, quick and energetic.

Down in the valleys, and contiguous to the seas, the people are engaged more in mercantile pursuits. On the Sea of Moisture, vessels of small dimensions are sailing, loaded with freight. On this sea there is more commerce than on others. On the Sea of Clouds are seen pleasure boats, some are racing and others sail leisurely along to enjoy the voyage. Farther to the west is seen the Sea of Crisis; here near the coast are ragged falls dashing over precipitous rocks. The sea is rough and vessels are tossed upon its surface. Fish are abundant and notwithstanding the roughness of the sea, fishermen risk a sail for the supply. Between the Sea of Crisis and the foot-hills of Mt. Tycho are scattered commu-

nities, and in addition to the pursuit of agriculture, they deal largely in fish. Here are seen people from the mountain towns of Copernicus and Mt. Kepler and from the coast of the Sea of Tranquillity. The markets are extensive, running the entire length of the street of these settlements, for no fish on the moon equal those from the Sea of Crisis. Picture a little fisherman's hut in one of these settlements near the sea. The hut six feet in height and the ground floor ten feet square. The carpet made of seal skins and the partitions to divide the rooms are of wood, for forests exist there. Its furniture made up of things as nature shaped them. Its occupants consist of a fisherman, a foot and a half in height, and a wife whose height was but a foot and a quarter, average size, and a boy frolicking here and there with his schoolmates about him. The father had just returned from a rough voyage on which he was nearly wrecked. He brought home, however, an abundance of fish. He was about to start on another one.

His wife begged him not to go again, his little boy pleaded feelingly: "Wait a little longer," he said, "until I shall be old enough to take your place, and then I will get fish and sell to support you and mother, you have enough and to spare until then." Said the father to the boy, "Diago, don't follow the sea for a livelihood, do what else you may, but not that, no, no, not that. It's a hard life and many dangers have I passed through. I will take another voyage and then I am done." And as he left his hamlet for the sea, his wife and boy with sorrowful

hearts bade him adieu. A month sped by, the time for arrival in port was past. The mother and boy looked anxiously out upon the waters of Crisis day after day and night after night but nothing could be seen indicating his return. It was not many weeks after when a huge fish, something the nature of a shark, was caught and brought ashore. It was opened and its fat tried for oil. In its stomach was found something the shape of a wallet, on this was discovered these initials J. R. D. These marks were recognized as those of Diago's father, and the parcel when taken to Diago and his mother was also identified as belonging to him. Great was their sorrow when they learned these tidings. Diago accepted his father's advice and determined not to follow the sea. He was a favorite among the boys, for he was a brave fellow, and that they admired. He was also a good scholar. Living near the sea he frequented the water and was known to be an expert swimmer. Years passed on and he grew to manhood. He became a teacher, not of common branches, but of the sciences and the art of self-defence. A great storm was in progress on the northern portion of the moon, the great seas, the Sea of Moisture, Sea of Clouds and Sea of Crisis were in great agitation. The waves dashed high, and it was unsafe for a vessel to be out. All day and all night the storm increased, morning came and the people thanked God that the storm was over, but the sea was tumultuous. What a sight was there, vessels not far from the shore were wrecked, men, women

and children could be seen hanging to the vessels. The coast was lined with masses of people. Some were screaming and some praying for help to save the helpless victims. No one dared to go, the sea was so angry. Hurried steps were heard behind them and all was hushed. It was Diago, just arrived. Not a word was said, all knew that he was the hero of the hour. He looked about for something to float, no boat was near, nor boards upon the beach. He looked towards the hill, something met his gaze. "Come on, boys." All wondered where he could be going, but they followed. "Take hold, boys," said Diago, "and we will drag this broad but thin slab of pumice stone to the water, it will float." The frequent volcanic eruptions furnish plenty of this material on the moon. They went to work with zeal and drew it to the sea, a long rope was attached. "It will hold a hundred," he said. It was placed upon the water, Diago jumped upon it.

"Now boys, who will accompany me?" No one dared to venture. The strong gale wafted the stone raft from the shore and by the aid of a large paddle he guided the float. The tendency was in the direction of the wrecks. The wild waves would sway over the raft and Diago with all his strength had a hard struggle to keep from being washed away. The multitude on shore watched him with awe. Now they saw him battling with the waves and the next moment he was lost to view, again he appeared sailing on. The crowd sent cheer upon cheer after him, the women waved their hands and on he floated.

He is nearing the wreck. Another huge wave strikes the raft, it is buried within its folds and lost to view; the people on shore are hushed, not a whisper, or the slightest movement escapes them, every eye is strained to catch a glimpse of the submerged raft, they are terrified and held motionless by the prolonged suspense, at last cheer after cheer breaks the awful stillness, they see the raft, though dimly, through the spray. It clears, they look again, the raft is empty. Diago is not there. Women shriek and the men groan. A speck is seen upon the water, it is floating towards the raft, it is Diago, a loud cheer goes out towards him, he reaches the raft, and is soon seen upon it. All is hushed again as he floats towards the wreck, he reaches it and calls to the poor unfortunates. "Those who are the most exhausted must be helped on board the raft first, then the others. There will be room for all," he said, in a commanding, measured tone, but disregarding his command a rush was made by the strongest for the raft. Diago who was a strong athlete, quick and powerful with his fist, gave two or three of them a broadside, and they hastened back upon the wreck. The weak were laid upon the raft. The other two vessels were close by. The disabled were helped. "Now," said Diago, "let the remainder cling to the edge of the raft," and though the surface was closely packed, and around the edges men were clinging with heads out of water, every soul was aboard save two, no space could be found for them. Diago waved the signal agreed upon on shore. They

pulled the rope, the stone raft moved with its loaded mass of humanity. Diago remained on the wreck with a child in his arms. He placed it on his back, its arms around his neck and immediately as the raft moved away he plunged into the sea and swam with his burden. The raft arrived first, and Diago struggling with the waves sank and rose and with superhuman effort reached the shore exhausted. The air was rent with cheer after cheer and Diago was lifted to the shoulders of the multitude and carried to his home.

CHAPTER IV.

Only one side of the moon is seen by the inhabitants of the earth. In its revolution around our globe, the same side faces us, hence the other side has never been seen by man. We have the moon-shine to light us by night and the moonites have the earth-shine to light them, only the earth being forty-nine times larger in volume than the moon, the light from our planet upon them is equal to forty-nine moons in the sky, hence the light by night to the moonites was a brilliant spectacle, but the poor fellows on the other side of the moon had a dark time of it, no light at night save what came from the twinkling stars above them. The dark line around the moon was as marked as the coasts of the sea, and thus the moonites were very naturally divided into two races, those living on the other side of the moon, bearing a much lighter complexion than those living on the side next to us, for the earth-shine had a tendency to make the inhabitants on our side a darker line than the others. So the moonites became as two people, two forms of government, and two nationalities. When the others encroached upon the territory of our siders there was trouble and a battle ensued.

Diago regained his strength and was at work again at his profession, a teacher. He taught by lectures and objects, and not by books. His praises were sung for his heroic deeds throughout the valleys between the mountains of Copernicus, Tycho and Kepler and by the Seas of Crisis, Moisture and Clouds. The peasants were busily engaged in their pastoral labors, the markets were well stocked and trade flourished. All at once tumult filled the air, people rushed to and fro. What is the cause of this commotion? A cry is heard, "The other siders are encroaching, our animals are seized and our lands are taken from us." Everybody is on the move. Preparations are made to meet the enemy on the other side. The government asks the people to volunteer and wrest from them their plunder. Many answered the call, and Diago was appointed leader of the forces in the portion of the country where he lived. His army was summoned. Women as well as men fight there. The army on the moon was not made up as are our armies here; no guns, cannons or swords are used, neither any weapon; the men use their fists, the women are armed with instruments filled with a fluid, something akin to pepper, which they inject into the eyes, if possible, of the enemy. The armies do not fight with intent to kill; this they think useless, for a victory can be won from sheer force of might, the strongest side and the pluckiest wins; death cannot make the victory more complete, nor more decisive. The march commences. "On for the border!" is the cry, and on they

80, a thousand strong, with Diago in the lead. Other regiments meet and join them. Horses are not used in their marches, for the elevations are precipitous, rocky and volcanic. They march afoot. After a few days' march they near the border. They rest and the following morning they form a line of battle. The other side is prepared to meet them. Their lines were one long continuous row, not two or more deep but single

Face to face the two armies met, each advancing slowly and cautiously towards the other. The attacking army, which in this case was "our siders," must give the signal of attack. Diago raised the signal, and in a loud, commanding voice spake, "Soldiers! we are fighting for our country, for our homes and for the right, come on!" and he led the way. Hand to hand the opposing parties met. Fist to the fist they strike. The female soldiers bring their instruments to bear upon the enemy, the point of attack is in the face. Diago is driving all before him, others take courage from his brave leadership. The "other siders" are faltering. Diago takes advantage of the situation and forces the battle to the utmost; the enemy is panic stricken, they fall back in confusion! they retreat! and the race for liberty commences. "Our siders" capture and hold as prisoners of war, both men and women, all that they can easily care for, and turn their footsteps homeward. The prisoners they retain as fellow workers and not slaves. Diago has among his captives a young woman who is a peer among them

all. He treats her very kindly during her captivity and pays her marked attention.

She is a beautiful woman, at home a princess. Her form, her features and her general appearance are not only handsome, but her intelligence is very marked, courageous, yet peaceful, cheerful and courteous. "Lunarette," that was her name, "I will not keep you captive longer," said Diago, "return to your home and I will accompany you to the border, it would be wrong to force you to stay here against your will. I entertain too great respect for your noble bearing, your courage, your virtues, and your intelligence. Go! from this hour I give you your liberty."

"Why not let me remain here with you?" said Lunarette. "I hold you in as high esteem as you do me. It is so beautiful here and your nights are so brilliant, while with us on the other side it is so dark, night after night, and colder than here with you."

"Do you not wish to return?" asked Diago.

"Not if you will allow me to stay here with you," she said.

"Nothing could please me more," spake Diago. "I shall feel honored and will do everything I can to make you happy."

"Good, good," she whispered. "I am content. Let me sit at your feet and pray tell me all you know of the beautiful sights around me. Treat me as your scholar, for I am hungry to gain greater knowledge. Say, Diago, what is that huge silvery ball in the sky that shines on us with such brilliancy *to-night?*"

“ That, my dear, is the earth, it is some fourteen times greater than our moon in weight, and in volume is forty-nine times larger. The diameter of the moon is somewhere about 2000 miles, while that of the earth is about 8000, and hence the inhabitants are probably about four times taller than ourselves.”

“ How far from us is the earth?” she asked.

“ Some 240,000 miles. It is very near in comparison to some of those stars. The North Star, for instance, is so far that it would take fifty years for the light to reach us had it just commenced its existence, and light travels something over 180,000 miles a second. Many of the stars are farther than that. So the earth is a very near neighbor, the nearest.”

“ I am listening, Diago,” she murmured. “ Every word is a chapter to me, tell me more. What else do you know about it?”

“ Well, she is our mother, we are dependent and revolve around her. It takes us nearly a month, say some twenty-eight days to perform one revolution, and at the same time we rotate on our own axis, performing a daily rotation, and what is somewhat strange only one side or face of our moon as it performs its daily rotation on its axis and its monthly revolution around the earth is visible to the latter body and always the same side and never the other side. So the inhabitants of the earth have never seen and never will see the other side of our moon, and that is why you always had dark nights at home. Now, Lunarette, do not let me for a moment keep you from your long lost home.”

"Am I a burden?" said Lunarette. "Do you desire my return?"

"Far from it," answered Diago. "It gives me happiness to be with you."

"This is paradise to me," she said. "It is so beautiful and I love to be here with you, let me stay."

"Yes," answered Diago, "if it is your will, and may God bless you."

"Tell me something more about that beautiful earth," said Lunarette.

"Would you like to get a closer view of it? I have powerful glasses that will bring objects upon the earth nearer to view;" and procuring them he directed the glass to the planet. Lunarette took an observation.

"What do I see?" she said. "It is covered with water. There does not appear to be any land or mountains on the earth as we have on the moon. Why is that, Diago? It is covered with one vast universal ocean."

"The earth is so much larger than the moon," answered Diago, "it did not cool as rapidly and consequently its development is slower."

"How can people live there with no land to dwell upon?" asked Lunarette.

"They do not live there," Diago replied. "It has not developed life yet."

"Are there not animals there?" she asked.

"No animals of any description, not even fish. The water is too warm to support life," he said.

"When the earth has expended a sufficient amount of its surplus heat to enable animal bodies to remain thereon without roasting, or in other words when a sufficient amount of heat has been expended, so that the earth will be cool enough, not only to support life, but to generate it and make it thrive, then, and not till then, will the earth begin to be inhabited."

[And this corresponds, in the geological history of the earth, to the Azoic or lifeless age.—ED.]

Lunarette took another observation through the glass. "I see some little dots of land this time, here and there, like small islands cropping out of the universal ocean. What are they, Diago?"

"You did well, Lunarette, you are a good observer, but few have been able to observe them. They are points of land which have recently appeared above the water, and are situated in the Western Hemisphere of the earth."

[In geological researches the first elevation ascertained, was near Hudson's Bay, triangular in shape, the next land that appeared was the Green mountains, then the Adirondacks, then the Rocky mountains, followed later by the Appalachian mountain system, the mountain ranges of Mexico and other mountains scattered over the globe.—ED.]

It was evening when Lunarette and Diago were observing the earth through their glasses. It was light and Lunarette as she put her glasses aside saw but a little distance away, the people running here and there. "What does that mean?" she said. "Everybody is running." Diago knew well the cause.

“ My dear Lunarette, we also must run for our lives, flee to the mountain ! the moon trembles. Look ! see the volcano above is belching forth fire, cinders, scoria and hot melted lava are running down its side, and if we do not quicken our steps, we shall be overtaken by it and our retreat to the mountain cut off.”

They ran, but down the lava poured, ashes and scoria filled the air, it fell and covered the mountain side and the valleys below. The eruption was intermittent ; again it belched forth, the mountain top was one mass of living fire ; up, up and up the scoria hissed into the azure sky. Tons after tons rose and fell until all the country around was filled many feet ; towns and cities were covered, and all living things above the sea, on the portion of the moon about which we have been speaking, were buried deep and beyond any means of escape.

[The present configuration of the moon exhibits the effect of an unusual disturbance in its past history. Eruption after eruption must have taken place as the immense amount of cold lava and extinct volcanoes testify.—Ed.]

CHAPTER V.

Our friends Diago and Lunarette met their fate bravely. It was an untimely death. As angels in the heavens they hovered around their terrestrial abode. We can picture them in each other's embrace speeding through space. Their love was deeper than the flesh, it pervaded the spirit, and when their bodies fell asunder, it became immortal and they loved as none but spirits can love, forever. Being deeply interested in the earth's development, when habiting the moon, they naturally would be attracted towards it and our mind will follow them in their investigations, and as time is a small factor in the other life, the progress of the earth in its enfoldment can be observed through them.

Said Lunarette to Diago, "How changed is the appearance of the earth since I first observed it on the moon. Then that planet was nearly covered with one vast ocean, with only here and there a point of land or rock lifted out of the sea, but now some of the spaces between those elevated points have risen which make quite a large island, or the beginning of a continent."

[In the second geological age, the Silurian Age, a portion of the continent of North America was lifted or elevated from the sea, and that was confined to

land around Hudson's Bay and a portion of Canada, above the Great Lakes and the northern portion of Wisconsin bordering Lake Superior.—ED.]

“ Look ! ” exclaimed Diago, “ life has begun to be generated upon the earth, that object moves, it has life. It lives in the water and stands on a long, upright stem attached to a rock. Although the stem does not move, the soft body in the shell feeds. There is another one and another, they are getting abundant, we will call them a *Lingula*, it is a mollusk and belongs to the family of Brachiopods. This shell is different from a clam having a hinge in the place where the two half shells join in the middle instead of one side. Brachiopods have also two spiral arms which serve as gills. Ah ! what is that yonder ? That is another animal very much larger than the *Lingula* we just saw. See, it crawls over the sands. It possesses thin plates which enable it to swim. It is about one and a half feet long and is a species of crab, something similar, only much larger than what we had on the moon, we saw them lying on the beaches, the horse-shoe crab. They belong to the class of crustaceans which have crusts over their soft bodies like the crust of a lobster. It is a Trilobite, one of the earliest animals that developed on the moon, as well as the earth. There's a worm, they seem to be of ordinary size. They are boring holes in the sand. There is a species which we called ‘ *Scolithus linearis*. ’ Look at that, it belongs to the kingdom of radiates, called a Crinoid. How curious its shape ! It looks like an elongated bud, and it is attached to

a stem ; see it now opening and throwing out feelers, radiating in all directions and drawing all food towards it that passes near on the water. The top of it has something the appearance of a star-fish."

"Behold this, Diago," said Lunarette, "what a singular animal. It is the shape of a stump of a tree, only very, very small, it is attached to a rock ; at the top of the trunk there is an opening, a mouth, around it are innumerable feelers which they seem to throw out. When an object passes which they want, their feelers catch it and draw it to their mouths. What can it be, Diago?"

"It is a Polype or coral builder, its stomach is a very small inner sac suspended loosely from the mouth, which is fixed around the latter. They reproduce by eggs, which are dropped in the sea, and finally lodge upon some rock where they hatch, develop and become fixed thereon. They also reproduce by branching out the same as a limb of a tree branches from a trunk."

"How do they make the beautiful corals we see on the moon?" asked Lunarette.

"Oh, those are formed in the interior of the Polype, it is a secretion of lime ; the animals form within as they grow, and when they die this rocky interior or skeleton is preserved. These animals cannot live in water deeper than a hundred feet."

"There is a weed growing in the water, what can it be?"

"That is a sea-weed and the only form of vegetation I have yet seen on the earth."

"What is that we see in the distance?" said Lunette. "Let us go towards it. What an enormous shell! Is it alive?"

"Yes, it is a Cephalopod, of the Orthoceras family. It is a monster measuring from twelve to fifteen feet and is about a foot wide."

"What is going on over there?" she asked. "Red hot fire pouring out of the earth, it is not a volcano, what can it be?"

"That is what happened on the moon before we were born, it is an igneous injection spurting through cracks or fissures in the earth's crust. When it cools it will form what we called on the moon 'trap dike,' a perpendicular, narrow, dark vein, running up through a rock. Do you see that bluish-green coloration in the liquid flame? Well, that is copper and when it cools it will be a copper-mine, a valuable metal."

"How strange, Diago, that we have not seen a spider, or an insect of any description yet, why is it?"

"It is because there is not sufficient land above the sea yet on which to develop them."

"What is more strange," she said, "I have seen nothing but shell-fish."

"I know of no reason, unless the water has not arrived to that even point of temperature to develop them."

"Diago, had we not better direct our flight homeward and come again later, it is so interesting to watch the progress and development of a planet."

And they sped homeward, for so in harmony were

these wedded spirits that the thought of one was instantly incorporated into the being of the other.

Another age passed on and we are now approaching the third age, the Devonian Age or the Age of Fishes. More land is lifted above the sea than in the last age; the North American continent for example has extended its area. It now embraces New York State, Pennsylvania and the Middle as well as the Northern States; the Canadas, a narrow strip of land from Illinois westward to the Rocky mountains. The Southern States are yet at the bottom of the sea.

Our friends Diago and Lunarette have returned to note the great advance in the earth's development since their last visit.

"What a change," said Diago. "The continent has grown. Ah! observe those objects moving in the water, they are fish, they seem to have a portion of the reptilian characteristics, they belong to the Ganoids."

"See that fish!" said Lunarette, "moving his head up and down, unlike an ordinary fish, and it seems to breathe like land animals. It has an air bladder, with a lung-like structure, its teeth appear like a reptile. It moves through the water by paddles, instead of a tail. It is very large. Ah! there is a dead fish on the shore. It is an invertebrate. Fishes have not developed a backbone yet, there are holes at the sides of the head where the gills ought to be, they are undeveloped. There is a fellow coming towards us; it is a species of the

shark, it is carnivorous. See it catching those shell fish and devouring them; he is a huge fellow, could take in two or three men and then have room to spare."

"Do you see those plants?" said Diago.

"Yes," she answered, "they are ferns and ground pine, how beautiful, and there is a large grove of tall pines growing. This is the first time we have seen vegetation on the earth," and they departed.

Another age passed on and we have entered the fourth, the Carboniferous Age. Our friends Diago and Lunarette reappeared.

"Why!" exclaimed Lunarette, "what a change has come over the face of the earth; not only has the land risen from the water and covered quite a large part of the planet, but immense trees have grown, they have peculiar marks on their trunks. What very large ferns, tall and stately as trees."

"Look here," said Diago, "further on. What is that so black, it looks like the coal regions on the moon. It seems to be in process of formation. See those trees in yonder swamp standing in water, some have fallen, they cannot remain long in water. In process of time they fall, a tree cannot live with wet feet any more than a man. They are covered with soil blowing over them, which causes decomposition and heat, and like a charcoal pit, it burns, smokes and smoulders and is in time carbonized. After several more growths it decays. In the march of centuries we have a coal mine such as is being formed to-day. See what a low, marshy land there

is spread over the earth and how it is covered with forest and jungles and how luxuriant the vegetation, but I can see no grasses or mosses as grew on the moon, nor are there any flowers yet to beautify the scene. Ferns and fern trees seem to prevail. There is a large tree with scales on its trunk and holes here and there over it, it is the *Lepidodendron* I should say and there are some Conifers of the pine family."

"What are those animals," asked Lunarette "crawling about?"

"Those," answered Diago, "are scorpions. Look farther along, what a variety of insects, those appeared since we were here last. When here before vertebrates made their appearance in the shape of fishes and now we see a little farther along reptiles that inhabit the water a portion of the time. Land and water disturbances are going on."

Our friends speed away again, but in the course of centuries return.

"How changed is everything about us," said Lunarette. "The continents have sunk, what has happened since our last visit, where we then saw land, we see now nothing but water."

"That," says Diago, "is due probably to the unsettled state of the planet, it has not its growth yet, the crust of the earth has not sufficiently hardened. A little below, there is a boiling caldron and the crust is not sufficiently thick and fixed to withstand the immense pressure from the intense heat and the gases within, hence the contraction and

expansion or the depression and bulging of the crust at different seasons. Notwithstanding we see a large portion of the planet covered with water again, we shall see undoubtedly, when we re-visit it, elevations of land as we observed in our former visit."

We are now approaching the fifth or Reptilian Age and after the lapse of centuries our friends return.

"Well," said Lunarette, "your prediction has proven true, the land has risen again and there are greater elevations than before, there are hills and some approach mountains. The earth is really developing into something, we have seen trees and various kinds of vegetation, we have seen the development of animals of the lower order, but no human beings."

"Oh, no," said Diago, "the earth is not ripe enough, not sufficiently developed to produce or support man on its surface."

"What is that nearing the shore?" exclaimed Lunarette, "what an enormous animal, it is not a fish, nor a reptile, it is both; its head is that of a huge reptile, large, elongated mouth and teeth. It has fins by which it paddles its way through the water. Its vertebra is deeply concave, similar to the fishes. It must measure thirty feet."

"That," said Diago, "is what we call on the moon an Ichthyosaurus, meaning fish and reptile."

"There is another coming," exclaimed Lunarette, "it approaches nearer, it is unlike the other, it has a long snake-like neck, and a small head. It has for paddles long fins something like the whale; it is some twenty-five feet long."

"It is a Plesiosaurus," said Diago, "there is another species farther along, reptilian form, it comes nearer, what a monster, it must measure thirty-five feet."

"That," said Diago, "is the Pliosaur."

"Look up!" cried Lunarette, "what is that flying above us? What a strange creature. It looks something like a bat, yet it is not a bat, it is much larger; its spread of wing must be ten feet, it has the head of a reptile, it opens its mouth which is full of large teeth; it has no feathers, its wing when stretched is an expanded membrane and the bone of the outer phalange or finger is elongated and reaches the tip of the wing. It does not resemble a bird in its makeup. It seems to be a flying reptile. What is it, Diago?"

"It is a Pterodactyl and the bones are hollow like a bird."

"There is another large animal crawling along the marshes, from twenty-eight to thirty feet long. It is eating the plants and shrubs about there, it stands high, like a quadruped; its massive legs must reach five or six feet. It looks like a huge lizard or a crocodile and has teeth like them."

"It is an Iguanodon," said Diago.

"I have not seen any snakes yet," she said.

"No," he replied, "they have not developed yet."

We are now approaching the sixth, or the Age of Mammals, and Lunarette and Diago have returned from their journey homeward and are active in their observations again.

"The mountains upon the earth have become quite large," said Lunarette.

"Look," said Diago, "at the rocks and see those marine fossils imbedded there, how plainly does it indicate that those rocks were once at the bottom of the ocean, and through some internal convulsion, or upheaval, were lifted above the level of the sea. It may have been very gradual and probably was as we have observed in past ages."

"Birds and quadrupeds are beginning to appear now," said Lunarette. "In fact they seem to be quite numerous and how large they are. What is that strange creature jumping about in that bog-hole? He looks like a frog, but he is too immense for that."

"That," said Diago, "is a Batrachian, a species of frog; he is a huge fellow, his feet must be twenty inches in length. Look at that creature running along, it is a bird; its wings are not large enough to enable it to fly high. It is the largest bird I ever saw, it must stand twelve feet in height. What are those things we see farther along? They are eggs, and over a foot in diameter, laid by that bird. That egg is equal to about one hundred and fifty hen's eggs. The bird is called *Æpiornis Maximus*."

"What is that we see in the distance?" asked Lunarette, "let us go towards it. It is a strange animal, it looks like a gigantic turtle. It belongs to the Armadillo family. What an enormous shell-covering or armor. It must be heavy to carry. See what large feet and legs it takes to support it; the armor on its back must weigh a ton."

"It is called," said Diago, "the Glyptodon."

They journeyed toward the forests, and Lunarette started back at the sight she saw before her. "Look," she said, "what is that creature yonder? With its hind feet and legs on the ground, it is reaching to the upper limbs of that large tree. It breaks off the limb with the ease of a child breaking a twig. It is eating the leaves, yes, and the small branches. The length of its body is certainly eighteen feet and some two yards across the loins, and upon all fours it will stand some nine feet high. Its pelvis and hind quarters must be three times as large as those of the elephant. The forefoot is a yard long and a foot wide; it is five-toed and has long and powerful claws. How slow are its movements, as slow as a snail. What can it be?"

Diago answered, "It resembles a sloth, it is called a Megatherium. Let us travel to yonder lake."

"What is that ripple on the lake?" asked Lunarette.

"I see nothing," answered Diago.

"Look among those tall rushes and reeds near the shore," she said, "it moves," and they drew nearer. "It rises, it lifts its head above the water, it is walking to the shore. Its head is like an elephant, only its tusks are on the lower jaw and proceed downward. Its trunk or proboscis is shorter but more powerful than an elephant. Its body resembles that of a hippopotamus and its huge legs must be ten feet long. The body is some twenty feet

in length. Watch its movements, it uses its downward curved tusks as a pickaxe, it is digging with them; the large succulent plants growing near the shore, see it devour them. It takes into its huge mouth a half bushel at a time. What can it be?"

"That," said Diago, "is one of the largest quadrupeds ever known. It is not a carnivorous animal, but lives on vegetation entirely. It is called the Dinotherium."

Farther on they travelled, but suddenly stopped.

"There is an elephant," said Lunarette.

"No," answered Diago, "it is not exactly an elephant, it is a Mastodon, its teeth are not the same and its body is much larger, its tusks are fourteen feet long."

"Look at that animal running and leaping yonder. How swift it travels, it runs like a deer, but two or three times as fast."

"It is called Megaceros Hibernicus, a gigantic Elk. I judge it is ten feet in height and the spread of its antlers some fourteen feet."

"Why is it that we have yet met no wild or savage beasts, carnivorous, flesh-eating animals?" asked Lunarette.

"Those animals," answered Diago, "have not developed upon the earth yet, they belong to a higher order and in time probably will make their appearance. The quadrupeds as yet are mostly herbivorous or plant eaters."

"Why is it, Diago, that the animals we have seen are so much larger than those on the moon?" inquired Lunarette.

“That,” said Diago, “is due to two causes; first, the earth being much larger than the moon produces larger animals; and secondly, this age, the age of mammals, develops much larger animals than the next age, possibly because the earth is larger now than later in its development. Age, time, reduces its bulk. In the next epoch they will be of finer quality, smaller and more intelligent. We found that to be true in the geological history of our little planet, the moon.”

CHAPTER VI.

We are now approaching the pre-historic age. Dingo and Lunarette are returning to our planet again, eagerly studying its development, and what more instructive and agreeable occupation can a spirit be expected to follow in the hereafter than in observing the formation, development and decay of worlds in the boundless realms of space.

"There is an animal we have not yet seen. Look at its broad feet," said Lunarette, "it steps on its heel like a man, it is black and long-haired; see, he is going into a cave."

"That," said Diago, "is a cave bear."

"There is another farther on," she said. "It is striped and has a big head and long snout; it is an entirely different animal."

"Let us see what it is," said Diago, "why that is a hyena, a cave hyena. There he goes into a cave."

"What do we see in the distance?" said Lunarette. "I believe it's something on two legs, it's a biped, I see it walk, and how erect. If I dare trust my eye I believe it's a man."

"Let us approach nearer. You are right, it is man."

"But how peculiar his appearance. What

small head, but little brains there. Look at his retreating forehead and observe his massive, projecting jaw, not as large as that of the gorilla, but massive compared to civilized man. How robust and broad shouldered, powerfully built and hairy. There is another approaching him, and still another. They hold massive clubs in their hands. The cave bear is coming out. Look, Diago, they are attacking it, the bear shows fight. See them struggle, the bear is upon them. Ah, that fellow behind has given him a death blow, he staggers and another blow finishes the poor beast. They pull off his hide; and look, they are eating him uncooked. How ravenous they are, other men are coming. See them struggle and fight for the meat. They are as savage as beasts, hear them yell and scream, pulling at each other's hair; they snatch their clubs and are using them with the desperation of fiends. One falls and the new comers escape with hunks of meat in their arms. That terrible blow on the head of the man who fell, killed him. They surround him and with their feet kick and turn him over. Not a particle of sorrow do they manifest, they seem to be filled with joy. They join hands and dance around the body of the victim yelling and screaming the while. They seem to have no audible language that we are accustomed to hear, their mode of expression appears to be a medley of grunts, yells and screeches. Did you ever see anything like it, Diago?"

"No, dear, I have not. This must be the beginning of the Age of Man. He necessarily is very crude and barbaric, not much above the ape."

"What are they doing?" cries Lunarette. "They are tearing the limbs of that dead man apart. What! they are eating him! Hear them smack their lips. How beastly they are, and how blood-thirsty."

"They are largely carnivorous," said Diago, "they care nothing about plant food, they want flesh and take anything within their reach. Let us journey farther," and they travelled on.

"There are other men coming out of that cave, what are they doing?" she said.

"They live there," answered Diago. "They are cave dwellers and are living in the Eocene epoch, a million years or more before the age of civilized man."

"What are they doing with that little child? It is a cripple, that man is raising a club. Ah! with one blow he sends it to the ground, another blow and the poor little one dies."

Says Diago, "They kill maimed children, see those men gather about, they dance around it, yelling and screaming in their wild carousings, they cease. See them scramble for it, each one struggling and fighting for a piece of the body."

"They are eating it! How can they do it, Diago?"

"To civilized beings," answered Diago, "it is a horrid sight, but to the pre-historic men who are but a degree above the brute, it seems no more to them than to the tiger who delights to kill and feast on the flesh of man." They journey on and another cave is reached.

“What is that on the bones about the cave, Diago? There is something carved upon them, it is the form of a hyena, and there is another one with the bear carved upon it.”

“That exhibits,” he said, “the work of man, and that he has dwelt in this cave and carved the form of these animals upon the bones at his leisure.”

“Look at that bone,” she said, “that is the bone of a man, it is in pieces and thrown upon the ground, after it had been gnawed. There is another bone, a much smaller one, the bone of a child. See the marks of human teeth upon it, what barbarism. They use the skins of animals as covering for their bodies. What is that huge animal approaching in the distance, it looks like a rhinoceros, it has hair upon its body, it is also woolly.”

“It is,” said Diago, “a woolly-haired rhinoceros. In this cold climate, at this period of the earth’s development it requires hair and wool to keep it warm, while in the tropical region where it will be found later, it will require none and will be found without either.”

“What are those men doing?”

“They are digging, making a pitfall to entrap that monster,” said he. “He is approaching it, those barbarians are cunning, they hold rude weapons in their hands, they hide and the rhinoceros falls into their trap. They hurry to the scene and with their weapons despatch the beast.”

“Diago, they seem to be master of everything about them.”

"Yes," answered Diago, "they attack formidable animals and by their cunning devices they can conquer anything with which they come in contact."

These happy spirit students have departed but soon they return again.

"What are those yonder, Diago," said Lunarette, "on the lake? There appear to be habitations on the water, there are human beings moving in and about them. What can it mean?"

"Similar houses," Diago exclaimed, "were once upon our own planet, the moon. They are lake dwellings, and the people living in them are called lake dwellers."

"But why are they built on the water?"

"Don't you see, my dear, they are built on the lake, to protect themselves against the ravages of wild beasts. They build them in the middle of the lake and when they wish to go on the shore they place a split trunk of a tree from the house to some posts which have been driven into the bottom of the lake and thus reach the shore. At night they pull the walk in towards the dwellings and are thus comparatively safe."

"How," she asked, "do they build these dwellings on the water?"

"Oh, that is easily accomplished. They fell trees with stone axes, for this you must remember is called the Stone Age, when all utensils are made of stone. One end of these fallen trees is sharpened by burning. The piles are driven into the mud from two to five feet, where the bottom is hard and

the piles cannot be driven. Stones are heaped around them to keep them upright. They are allowed to project out of the water from four to six feet, and upon these is laid the platform on which the hut rests."

"It is quite a village," said Lunarette. "There must be three hundred dwellings, and a thousand people inhabiting them."

Away our friends speed again, and after another lapse of time they appear.

"Look yonder," said Lunarette, "do you observe those people coming out of that mound? It is hardly high enough for a mountain, there are others going in."

"Those are Mound Builders," said Diago, "and those mounds are used for homes and for temples."

"There is one," she said, "with stone steps to the very top; there are two or three staircases on different sides. How large a mound do you think it is?"

"I should judge that is nearly a thousand feet around its base, and about seventy feet in height."

"There is another one," she says. "A truncated pyramid; I think that is nearly seven hundred feet long, five hundred feet wide and ninety feet high. There seem to be a number of low and smaller mounds, some not over twenty-five feet high, and some not more than six feet. It is a village, see the children playing about them. Yonder is an immense mound, what can that be, Diago?"

"I think that is an enclosure where the mound

builders assemble in time of war. There must be an area of some thirty acres in that mound embankment. It is rectangular, some 1300 feet long by 1000 feet wide with an opening at the ends."

"Let us go back and look into the interior of those mounds we have just passed," said Lunarette. "Ah! there is pottery, those are vases. What an immense amphitheatre within, see the steps winding round and round, upward to the very top. Look at the utensils they are using. There are axes, chisels, drills, knives, lance-heads made of copper, also bracelets, pendants, beads, etc."

A year or two has passed and they return.

"Ah! Diago, what do we see in the distance, they are fighting. Two armies opposed to each other, one of the armies is within that thirty-acre mound embankment you described during our late visit there. The other army is endeavoring to scale the embankment and capture the opposing force. What are their weapons, Diago?"

"They are using lances," he said, "with spear heads."

"Look," she said, "the invaders have reached the embankment, they have scaled the top and those within the mound have lost the battle."

"Not so sure of it," exclaimed Diago. "The men within have copper axes and hatchets. Ah! the invaders fall back, the air is filled with hatchets, watch them; they are taking effect on the heads of the enemy, see that fellow's head split open, he falls; watch the unerring certainty of that flying hatchet,

it will accomplish its errand. Ah! see it cleaves the head of that invader, and he falls to the ground. Their aim is sure, and unless the enemy retreats they will be cut to pieces. Ah! they retreat, the hatchets are flying after them, they cease and the surviving invaders have escaped. Look at the ground, covered with dead bodies and hatchets here and there beside them."

"What a terrible battle!" said Lunarette. "I trust I never shall see another. Let us depart."

1

2

3

4

5

6

7

8

9

10

11

12

13

14

15

16

17

18

19

20

21

22

23

24

25

26

27

28



SECOND BOOK
50th EPOCH
PRIME OF LIFE.

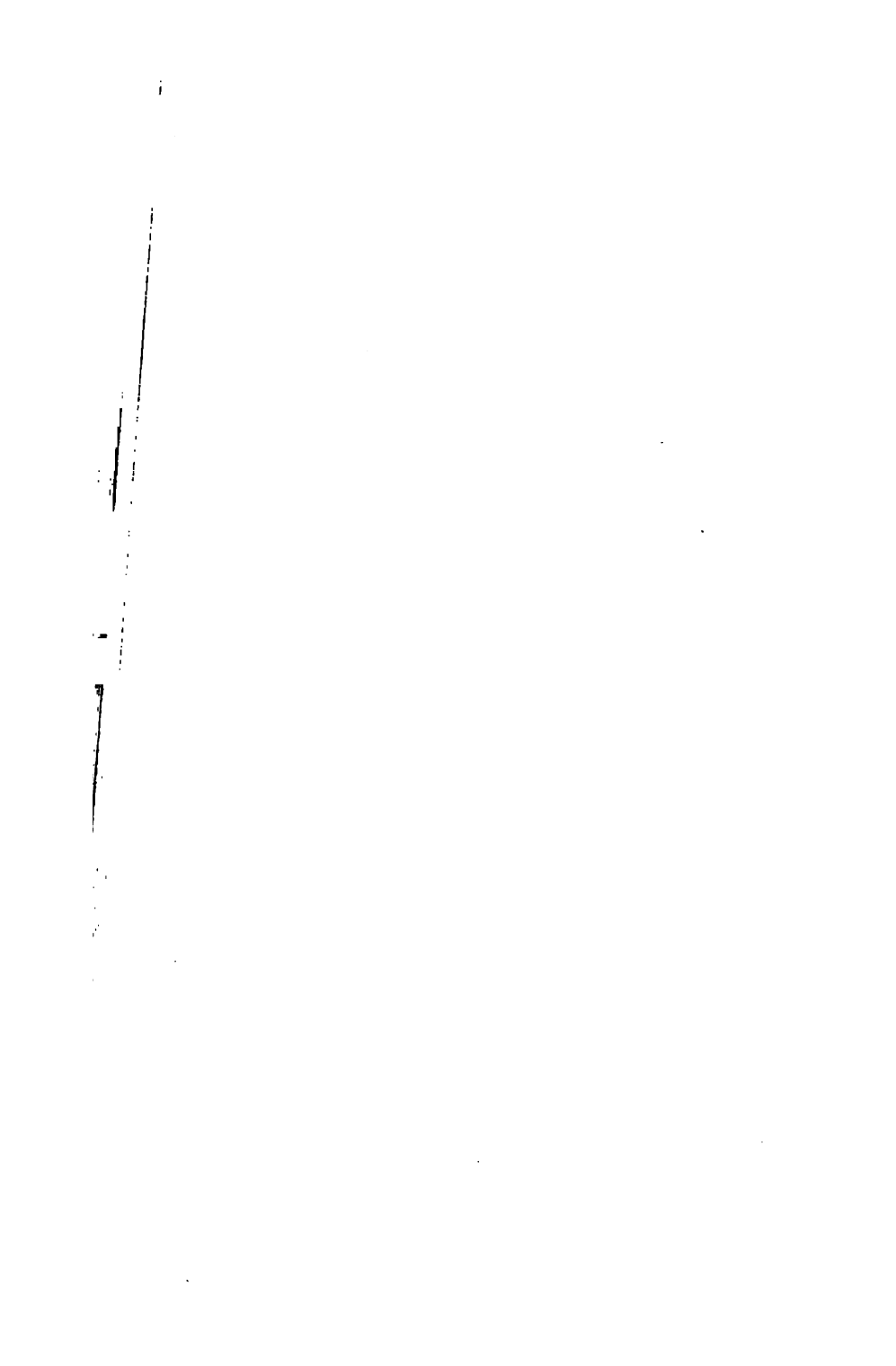


INTRODUCTORY.

The inhabitants of the globe at this era are much smaller in stature than in the nineteenth century. The height of man in the latter period was about $5\frac{1}{2}$ feet, in the 50th Epoch the average is about $4\frac{1}{2}$ feet, and a five footer would be as tall then comparatively speaking as a six footer in the nineteenth century or the 35th Epoch.

The tendency of nature in her development is to reduce, refine and throw off the coarser properties. In the early history of the earth's development, trees and animals were prodigious in size and a gradual refinement and reduction of bulk has been continually in progress since. The complexion of the people at this period is lighter in all climes than in the nineteenth century.

The clothing for the body is of much thicker material, the houses larger and built warmer.



CHAPTER I.

In South America some fifteen or sixteen degrees south of the equator, on the foot hills of the Andes, in Peru, and in the city of La Paz, the events that I am about to describe in this epoch occurred.

“Leonia,” said Lodo, “I discovered a short time ago while visiting the National Museum an ancient work of an antiquarian giving a glimpse of a very remote epoch, when animals were employed in conveying people from place to place, wood and coal burned to produce heat, wild animals hunted for food, and steam used in engines to propel vessels, cars and machinery. What antiquated notions must have controlled these ancient people. This book was very interesting, revealing many things of the distant past which seemed marvellous in comparison with the progress reached in our own age. Witness the contrast in the height of our mountains to-day and of that ancient period.

“In the thirty-fifth epoch, Mt. Everest of the Himalayas was 30,000 feet high while now it measures but 15,000 ; Mt. Blanc, about 14,000 feet, now but 7000 feet ; Pike’s Peak in Colorado some 14,000 feet, now but 7000 feet ; Mt. Washington, 6000

feet, now but 3000 feet; and the same reduction in the height of nearly all the mountain ranges on the earth's surface has occurred."

"Then," said Leonia, "the elevation of mountains reaches but one half the height to-day as during the nineteenth century or the thirty-fifth epoch?"

"Exactly, except in a few cases the reduction has not been in the same ratio, for the summits of some mountains are made up of harder material. Those composed of quartz for example have not shrunk as rapidly as those composed of softer material, such as limestone, etc."

CHAPTER II.

As Leonia and Lodo are discussing these subjects, a maiden of twenty summers is approaching a door at the rear of the study and quietly walks unobserved to the seats occupied by the conversationalists and whispers something in the ear of Lodo.

“Why, Selucea,” exclaims Lodo, “you here?”

“Here I am, and Leonia is well?”

“Very,” she answered. “I have been so interested in hearing brother comparing the present with the past. Think of the mountains double their present height ages ago.”

“Who says so?” asked Selucea.

“Lodo, of course.”

“That is good authority,” said Selucea. “One of the highest. If it came from anybody else I should doubt it, and yet I cannot conceive why mountains should change; no such change has been made in our time, or in the time of our grandfathers or forefathers, as far as we know.”

“Not apparently,” answered Lodo, “and yet there is a change going on to-day, but so small it is imperceptible; what can a hundred or a thousand

years do to change the features of the earth's surface?"

"But what evidence, Lodo, can you bring forward to support your theory?"

"He has found," quickly answered Leonia, "an antique work in the National Museum that gives the elevation of mountains in that remote epoch."

"Very good," replied Selucea, "but that may not be authentic, it is a good while ago and in the course of ages, figures may have gotten mixed, nothing is easier."

"Well my friend," spoke Lodo, "there is one thing that is not mixed, the stratification of the rocks that make up the mountain tops; the record is there and it will take more than the many epochs the earth has yet passed through to blot it out. If you look at the geological formation of these summits you will notice that the strata of the rocks lie in an incline or almost vertical position, one strata underlying the other, and the upper ends of these strata terminate abruptly, while according to the records of geologists in the thirty-fifth epoch, some of the mountains and hills of that age were covered with earth, and the strata of rocks on the summits were undisturbed and continued unbroken from one side of the mountain over the top to the other side."

"But," said Selucea, "how is that possible?"

"Because," answered Lodo, "when the elevation of the mountains took place it was very gradual and the strata of rocks overlying them were lifted up and gradually bent to accommodate itself to the new

situation. The same as flagstones on our sidewalks will be found gradually bent to suit the settling earth beneath."

"And how," enquired Selucea, "do you account for the change having taken place in these breaks, or abrupt termination of the stratified rocks found now at the summits?"

"Simply this," replied Lodo, "the erosive action of rain and the wearing action of wind has in the course of time, aye ages, worn away the mountain tops and the uplifted strata which we see to-day in the square, flat, abrupt termini on both sides of the mountain show how time by wearing off the continuous rounded curves of these strata has left us these silent witnesses to tell the story. The same as we read in ancient times of the government being obliged to build sea-walls to protect the islands from washing and wearing away."

At the close of these words, Lodo left the room.

After a moment's silence, Selucea broke the spell.

"Tell me, Leonia, why is Lodo always cudgelling his brains about the earth's history?"

"Because he is more interested in it than in anything else. He is a student in progressive development and searches and follows with eager interest anything and everything that has to do with the growth of our planet in the past or present."

"I cannot," answered Selucea, "but admire the energy and persistency with which he pursues these studies, but really I am a little worried and fearful lest his too close application will wear him out pre-

maturely, he must rest." And as Lodo re-enters the study, Selucea meets him, and placing her soft hand in his says, "Lodo, I want you to accompany me to the entertainment to-night at the Oaks."

"Excuse me, Selucea."

"I cannot," she answered. "I shall call for you at half-past seven o'clock," and departed.

When the stroke of the clock sounded the hour, Selucea was at hand and both left the mansion for the Oaks. This forwardness on the part of the maiden may seem strange to the reader of the thirty-fifth epoch, but Selucea was in love, and for ages before the fiftieth epoch, the old custom for man to court was abolished, and women in the latter epoch were as forward in paying attention to men, as were men to women. Both sexes were equal, and when a woman had formed the acquaintance of a gentleman she loved, she sought his love in return and when in her estimation the proper time came she felt free to confess it and ask him in solemn reverence to unite with her in marriage. Women in that distant age had no fears of any insult or harm at any hour of the night from man or beast.

CHAPTER III.

Said Selucea to her mother on the following morning, "Mother, we read that in ancient times it was the custom for women to wait until some gentleman proposed to her in marriage; why was this?"

"Because it was considered immodest for a young lady to be forward."

"Very well," answered Selucea, "but what did she do, did she remain single during her life, because the gentleman she loved and adored did not happen to propose to her?"

"Of course she did, she had to wait until some one proposed."

"But," answered the daughter, "perhaps the man who asked her hand in marriage might not be the one she loved the best."

"Then she must take second choice."

"It might not," said Selucea, "be the second, third or fourth choice, but the fifth or sixth; was there not some way by which the lady could signify to the one she loved that he was her choice?"

"Oh no," the mother replied. "Ancient history says that would have been considered bold, immodest and too forward on her part; she would have

been made a target of ridicule for young men and women, and a young maiden then feared the ridicule of others more than an electric shock. Should she at first show even the faintest sign of love, many men would turn from her in disgust, the conquest being too easy."

"Then," said Selucea, "a maiden would have been obliged to spend her entire life upon this earth without tasting the joys of a married life, because forsooth the fashion of the age forbade her to signify in some way her love, and desire to unite with the man of her choice in marriage."

"That is it, my daughter," her mother replied.

"Why should it be given to man alone," said Selucea, "to choose a partner in life, and not to woman? All men could marry if they chose, but all women could not; half of them, and doubtless but a quarter would succeed in obtaining the man of her choice. What a terrible thing to have been born in such an age. I thank God that it was my lot to have seen the light in this era. You are aware mother that I am in love with Lodo, I love him for his ability, for his courage, for his devotion to the pursuit of knowledge, for his manly beauty and carriage and for his nobleness of character. I think and feel that he would make me a worthy husband and bring much happiness to our wedded life, should I be so fortunate as to gain his love, but he is so engaged in profound thought and study, it is doubtful whether marriage with any one would ever enter his thoughts; such a man needs the care and attention that a wife could bring to him."

“But,” said her mother, “how can you interest one who is more in love with his studies than with you?”

“I think,” she replied, “that if my interest in him and in all that he does is made so manifest that he cannot fail to observe it, it will be very likely to rebound, and a like interest in me will result. I believe it to be a natural law, that like interests will attract like, other things being equal.”

CHAPTER IV.

As Selucea entered the home of Lodo she handed him a newspaper and remarked, "Here is something I think will interest you."

He opened it and read the following :

"The riddle solved and the missing link found. In Africa was discovered by a party of geologists the fossil remains of an extinct animal resembling in some respects the skeleton of a man. The only point of difference appears to be that the bones of the arm are longer, reaching almost to the feet ; the thumb, like man, is placed opposite to the fingers, and the jaw is considerably larger and more powerful, both the upper and lower maxillary. The teeth were large and more formidable, especially the carnivorous, but the cerebral hemispheres were as well formed as in the lowest orders of men, the frontal bone not any more retreating and the entire form of the head compared very favorably with the human. It has been sent to the National Museum."

"I should like to see it," said Lodo.

"It is well," said Selucea. "I will make the necessary arrangements at once, and invite you to accompany me, are you agreed?"

"Most certainly I'll not refuse your generous invitation."

And as soon as Selucea perfected the arrangements they departed. There is one thing it is well to mention here. In this epoch there was but one language spoken throughout the world and that the English language. Dead languages were taught in the schools, such as Latin, French and German for the purpose of investigating ancient history.

Lodo felt well paid for his journey, and in due time was at work in his study again.

Said Leonia, "Well, brother, what did you see at the museum?"

"That fossil," said he, "was truly wonderful, it closely resembled the frame of man, save in those instances the paper mentioned. The museum has an extensive collection of skeletons of extinct animals."

"Are there not wild beasts somewhere living on the earth?" inquired Leonia.

"It was but a short time ago," said Lodo, "that the last wild beast was slain, not one as far as known roams on the face of the earth to-day. As the inhabitants of the world increased, and the territories advanced in civilization, there was no room for the wild beast, he must go; man and he could not live together in peace, and he became gradually exterminated. The same is true of the lowest types of man, there is not a barbarian living upon the earth to-day. He was pushed on and on toward the sea and gradually exterminated, or else civilized,

and by marriage developed into higher types. Hence you will perceive that the gap between man and the beast until this fossil skeleton of the ape was discovered, was very wide. As the beasts were becoming extinct, and the lowest types of man were disappearing, the gap between higher and lower forms was constantly widening and if their remains had not been preserved, the chain in the history of evolution would have been badly broken, and this science nearly lost to the world."

Obeying the call of her mother, Leonia at once left the room. She had been absent but a moment when Selucea made her appearance.

"Ah, Lodo," she cheerily spoke, "all alone?"

"I am."

Lodo was about opening a book, Selucea sat by his side, her face beaming with happy smiles, but Lodo's features did not change, there he sat meditating. Selucea was a picture to look upon and admire, for a more beautiful maiden was not seen in the country about; many were the suitors for her heart and hand, but all of them she refused, and refused for what? to gain Lodo's love in return for hers which she had lavished upon him with her whole heart. He was her only choice, life would be a solitary waste without him, but it was all one way, Lodo's heart was not touched; he thought as much of her as any woman, but he was wedded to science and philosophy and had already won a national reputation which was the envy of many.

"Lodo," said Selucea, "do you think of the hap-

piness of others? I well know you do. Your sister is your pride, you love her and she returns it. Your mother is your idol, to whom you bow in holy adoration, you love her as none other could love and that is noble, I worship that love, and what is love? It is that something within which will sacrifice everything worthy of it, for the benefit of the object adored, that something which seeks without price the happiness of another, that something which calmly trusts that whatever is done by deed or word will come from the heart, pure and undefiled, for its highest and greatest good,—that is love.”

Lodo for the first time looked up into the eyes of the maiden sparkling like diamonds in a queen’s crown.

“Good,” said Lodo, “you are right, Selucea, that is admirable,” and his eyes still followed her.

“That same love bestowed upon your sister and mother so tenderly, could you not share it, Lodo, also with another, should it be proven that the same devotion to your happiness, your highest interest and greatest good, were made manifest?”

“’Tis possible,” Lodo quickly answered and at the entrance of Leonia with the announcement that dinner was prepared, Lodo arose.

“Now, Selucea,” said Leonia, “you must accompany us.”

“Oh, no,” she answered, but from Lodo’s persuasive invitation there was no escape.

After enjoying the repast, said Lodo to Leonia, “You will remember I was discussing with you a

short time since about the elevation of mountains, as compared with the thirty-fifth epoch."

"I do, but were there no hills in that ancient period?" she asked.

"Certainly," he replied.

"Then why do we not have them now?" Selucea enquired.

"Simply because the elements, wind and storms in the course of ages wore them away."

"But what became of them?"

"Washed and blown into the valleys, filling them, so that the country as you observe, is now comparatively level, mountains only break the monotonous landscape."

"Has there been any change in streams and river beds?" asked Selucea.

"There has, there are fewer small streams; not one in fifty that flowed ages ago, and the large rivers of the continents are not nearly as deep, the washing and wearing away of the hills have contributed in filling and closing smaller streams. Subterranean streams are abundant and if it were not for them, with our artesian wells we should fail to have water sufficient for mechanical, agricultural and family purposes. Those living in countries contiguous to the coasts rely largely upon water distilled from the ocean, which is made easy and general by the use of mammoth machines; they are, indeed, marvels of perfect mechanism. Large aqueducts conduct water from the sea and lakes and gulfs. It is distilled and carried hundreds of miles into the

terior. Were you ever in one of these aqueducts?"

"Never," both responded.

"They are a wonderful piece of masonry. In some of them, should a dozen men climb one upon another, they would fail to reach the ceiling, and that means between fifty and sixty feet in diameter, and yet they never leak, so firmly built are they."

CHAPTER V.

At dusk Selucea departed homeward. On the veranda her mother waited her coming.

“ Well, daughter, you must have been well entertained or you would have joined me before.”

They sat in the twilight discoursing together, and here let it be said in that age there was perfect harmony and freedom in expression of thought between parent and child, whether grown into womanhood and manhood or young and immature, whatever thought engaged its attention it mattered not; the character of that thought, the son or daughter felt as free and ready to express to the mother or father as the babe takes to its mother's milk, their spirits commune one with the other.

“ Mother,” said Selucea, “ Lodo and I were having a charming talk when the call for dinner broke the spell.”

“ What were you talking about?”

“ Of love, and I was so happy.”

“ But,” said the mother, “ did Lodo join with you in the talk?”

“ A little, very little, I was getting along finely and he was becoming interested, a few moments

more, mother, would have been precious to me, but that call to dinner broke it up, and now I must needs wait and bide my time."

"But," said the mother, "why need you wait and spend your precious time upon him, when at the movement of your finger, Solon, one of our first statesmen, who lives like a prince of old, would come at your bidding and pray to wed with you?"

"Because, dear mother, I love Lodo more, and cannot live without him. Love is not a thing of convenience that can be wrapped up and passed to anybody just for the asking. Healthy love is a mutual growth and cannot long survive unless it moves hand in hand, heart in heart."

CHAPTER VI.

“Where have you been, brother?” asked Leon

“To the site of an ancient mine,” Lodo replied

“Are there mines being worked to-day?” asked.

“Not one for metal on the face of the earth to knowledge.”

“But why do they not work them as of old?”

“Because they have practically exhausted metal, that is, I do not mean to say, there is metal in the bowels of the earth, but they have mined so deep, it costs too much to work them, and too expensive to land the ores at the surface.”

“How far into the earth have they gone?”

“Oh, some 6000 feet; it finally became impossible to shore the walls up with safety. Millions of people have been buried up in these fallen mines without moment's warning, and then again the heat became very oppressive, which also tended to weaken the solidity and compactness of the rocks and metals at great depths below. It is well known that to every sixty feet descent into the earth the temperature increases one degree, and even at the depth of 2000 feet it is pretty hot you may be assured. I have

been down into a gold mine at the depth of 1600 feet, where in the lowest level it was intensely hot."

"Pray what do you mean by level?"

"When a mine was being commenced a shaft 100 feet in depth was generally dug out, and then dug laterally at the right and left for ore, and sometimes miles in extent; these streets are called levels, and at every 100 feet descent into the mine, levels or streets are excavated and in these levels large chambers were mined as large as a church or hall, and here in later years while these mines were worked, communities of miners, with wives and their families, lived. They cooked, ate and slept there, because too much time was consumed in the passage up and down the deep shafts. The occupants, for change of air, came up to the surface once in every few days. In one of these mines there was a community of 1200 living souls, men, women and children and without scarcely a moment's warning, a rumble, a tumble and a roar was heard, and the mine caved in, burying every inhabitant save two who miraculously escaped to tell the world the sad story. The frequency of these calamities put at last a stop to these underground inhabitants."

"From whence," asked Leonia, "do all the metals that we wear, use and see about us come?"

"Nothing is lost, nothing can be cast away from the earth, hence all the metal that has been mined from the beginning is preserved in some form. Instruments, ornaments and machines in the course of time are worn, wasted, crumbled and are scattered

upon the earth ; there they can be and are re-collected, melted and used again in the arts, but these are found on or near the surface and not at any great depth."

" In reading the history of the distant past," said Leonia, " I find that gold and silver ore was found only in a few favored localities upon the earth's surface ; how do you account for this ? "

" Gold and silver ore was found mostly upon mountain ranges, not upon the summits but on the sides and foot hills, and found generally upon lofty ranges, rarely upon low mountains. It is my belief that the same internal force that threw up these lofty mountains, sent up at the same time these heavy ores, and as gold is one of the heaviest metals, and originally nearer the centre of the earth in its undisturbed condition, it required an intense effort to raise it to the surface, hence you will see that the mighty force from the interior that was necessary to lift these great elevations, must be one and the same force that was required to send up these heavy ores, and that explains why in high mountains gold and silver are found associated together. Leonia, I have an appointment to meet a body of savants to-night at the hall," and he at once departed.

CHAPTER VII.

An informal discussion was held on the condition of the earth's interior.

Said Franco, an old savant, "I am inclined to the old theory, though ancient."

"Will the gentleman," said one of their number, "be kind enough to describe it?"

Franco continued, "The earth was supposed to have proceeded from a gaseous, nebulous mass, and exceeded originally some 1800 times its present dimensions, but condensation took place by the escape of heat from its mass into space, and consequently it contracted and its size became considerably diminished. In the process of time from loss of heat, the outer portion began to harden, and a thin scoria or crust was gradually formed over its surface, the same as with any thick liquid mass, the outer portion or surface cooling first. Ages pass on, and the crust grows thicker and thicker as the earth's heat escapes, so that to-day, it is estimated, its thickness reaches some twenty miles or more."

"Why," suggested Lodo, "should the surface of the earth's liquid mass thicken or harden before the central portion?"

“Because,” said Franco, “that is the law of solidification. When a body of water solidifies where does it commence to become solid first, at the surface of course.”

“Very true,” answered Lodo, “but what is true of water is not true of scarcely any of the earth’s properties. Let us see. Melt most of the metals and let them cool off and solidify and you will find they will commence to grow solid at the bottom and centre first. In a heterogeneous mass, like the liquefied chaotic earth, containing mercury, water, gold, hydrogen, silver, nitrogen, the alkalies and alkaline earth, the bases and the acids, heavy and light all heaped together, when condensing or solidifying, the heavier elements begin to separate partially as the work goes on; the weighty constituents growing more heavy as they condense or solidify and sink gradually to the centre of the mass or globe, where is also situated the centre of gravity to which, of course, all bodies tend, the heavier with greater rapidity than the light. We have thus found by this process of solidification, which (excepting water) throughout nature is universal, that the centre solidified first and as rapidly as the particles throughout the mass condensed and sank; the addition of these solid particles to the solid core or centre, continually enlarges it, until in the course of ages the entire earth is solidified from said core to surface.”

In the assemblage sat an equal number of females, as distinguished savants as the males; said Trienna, a middle-aged maiden: “But in the ancient hypothe-

sis the earth when in the nebulous, vapory condition was composed of vapor which condensed into liquid, and it is very generally admitted that the globe was entirely surrounded with water, so it must be conceived that the solidification commenced as claimed at the surface, because water in solidifying expands and becomes lighter instead of growing heavier and denser; it floats and does not sink."

"Admitted," spoke Lodo, "if our planet was composed of nothing but water, but that is only one of the properties. The earth is a heterogeneous mass consisting of some sixty different elements contracting and becoming heavier, and sinking in solidifying instead of expanding. As the heat of our planet escaped sufficiently to solidify its entire bulk, the acids, elevated and surrounding the globe in gaseous form, began to condense into drops and fell upon the earth in form of acid rain; and combining with the bases, extensive compounds were formed such as sulphates, nitrates, carbonates, phosphates, chlorides, fluorides, iodides, cyanides, etc., etc. Last of all water; which up to this time was kept apart from the planet in a state of vapor, the earth being so hot that if condensation had taken place the drops falling upon the hot mass would have immediately vaporized. Ultimately, however, the crust becomes sufficiently cool to allow the condensed and precipitated drops to remain thereon and in consequence large bodies of water are formed and eventually the entire surface of our planet was covered with an universal ocean."

"May I ask the speaker," said a listener at this point, "whence comes the land that we see and move upon to-day; what have we to thank for the terra firma that keeps our heads above water?"

"Through erosive action," Lodo continued, "solid substances beneath become worn and sediments begin to accumulate, elevations make their appearance above the ocean, vegetation commences, marine animals have sprung into existence, mollusks, with their shells, multiply, death overtakes them and their shell covering contributes largely toward the formation of a sedimentary rock called limestone. Sand sediments or deposits are hardening into sandstones, clayey sediments into slates and thus through different agencies the work goes on, until through said erosion by water and the contributions of vegetable life, the accumulation of sediments over the surface of the earth hardened into rock extending miles into the interior."

Franco arose and said: "If the speaker's premises were sound his argument would be correct, but the facts as we find them existing in the past are not consistent with his hypothesis. We must not forget the existence of volcanoes, earthquakes and hot springs which remind us of a liquid interior, and that the increase of temperature of one degree for every sixty feet as we penetrate the depths of the earth, can be explained only by the hypothesis that the interior of the planet from the centre to within a few miles of the surface must be a molten, fiery mass."

To this Lodo with much calmness replied: "The

nucleus or interior of the earth has expended nearly all its heat, hence though somewhat hot, between this and the sedimentary strata of rock at surface which I have described, a few miles in thickness, there is probably a soft, plastic mass, produced as follows: When the condensation or consolidation of our planet was in process, water was kept at a respectful distance therefrom, because the earth was so hot and this liquid so easily vaporized, when in contact with a hot body, that all or most of the other constituents of our globe were condensed or consolidated into the solid earth and cooled partially before water condensed, fell and remained upon the planet; then commenced the accumulation of sediments produced by erosion or wearing action of water, and the formation and hardening of sedimentary rock strata before mentioned. These fine sediments become saturated with water to a greater or less extent, the latter in a heated state being able to penetrate most substances; so that the chemist finds by analysis that nearly all substances upon the earth's surface, even rocks and the larger portion of the most dense and solid matter found within this sedimentary deposit or strata, contain a certain amount of water. Go to the ocean's floor or bed bordering the coast, and large accumulations of sediments will be found thereon, washed down from the land above the shore. In the course of time deposits of considerable depth accumulate and it is ascertained that the bed of the ocean underlying these accumulations increases in temperature, the temperature becoming so great in fact, that this

floor beneath a considerable depth of these sedimentary accumulations is rendered sufficiently flexible by the heat created, that a concavity or a bending downward result, hence it is reasonable to suppose at the bottom of the accumulated sedimentary strata (say six or eight miles in depth) a considerable amount of heat must exist sufficient to boil water; and as these sedimentary rocks contain a certain amount of water the liquid finding its way through fissures and cracks to this distance in a free state, the steam penetrating said rocks and the amount also generated by water contained therein, separates their particles and dissolves or softens their crystals. Even silver or quartz, the hardest portion of the rock, is readily affected by this agency, assisted perhaps by the contact of the alkalies set free; and there results by this process a soft, plastic, semi-liquid mass, shallow no doubt, but of sufficient depth to furnish us with all the volcanic material thrown up at the earth's surface. Some of the strong acids are liberated from their compounds and assist in separating other compounds which were generated into gas through the action of heat; and by the enormous pressure of accumulated steam and various gases, rents and fissures are made by the pent up forces to effect escape through the crust, the pressure being so great that the soft, plastic, heated lava mass and the loose material in its path are sent up with tremendous force, affording the terrific grandeur of a volcano."

"Will the speaker," asked Trienna, "explain

why it is that the earth generally, or often quakes before the eruption takes place, or previous to the final escape of the pent up forces through the crater?"

To which Lodo replied: " Sometimes these forces fail in their attempt to escape through their regular outlets the volcanoes, then the earth's crust quakes and trembles until the ground opens in a new place and the forces effect their escape, not followed perhaps by any earthly material whatever. Other slight earthquake shocks or rumblings may be felt or heard when these forces are at work below, but fail to escape at all. The cause of said volcanic and earthquake phenomena lies as aforementioned more than six or eight miles beneath us, the depth of the sedimentary strata. In some places, where said strata are much thinner, as for instance in the Mississippi valley, the volcanic phenomenon is rare. The geysers or hot springs, you must have already anticipated from what I have said, are produced by the accumulation of steam below and the heated water forced up through fissures or cracks in the crust by this powerful agency."

Said Franco, " I would like to ask the speaker a question at this stage of his argument. If sufficient heat exists at this shallow depth to generate steam, by which the rocks and varied substances are softened, or converted to a semi-liquid mass, producing said volcanic phenomena, it stands without question that a like existence or condition of things lies deeper or nearer the earth's centre, consequently the

theory you advocate, young man, I must make bold to inform you is quashed."

Lodo not at all disheartened by Franco's master stroke, grows more eloquent and says: "The central portions of the globe beneath the sedimentary strata are anhydrite, that is, it contains no water in any form, while near the surface the rocks and earth are hydrate containing water in its varied forms and the absence of water below the surface or sedimentary strata described forbids any such softening, disintegrating effects as I have just explained. The great solvent power of water heated is known to every chemist. Take a test tube, place within a salt or some powdered substance, add cold water and in many instances the powder will not dissolve, it is insoluble in cold water, but by heating the water in the tubes the powder dissolves, or is rendered soluble. So in the accumulated sedimentary deposits or strata permeated with water; the latter becoming heated or converted to steam, rocks are partially dissolved or decomposed. The formation and crystallization of silica or quartz and its association with feldspar, mica or hornblende in granite and other rocks are supposed to be due to the action of heated water. The remarkably rapid pulverization of granite columns in a great fire in cities is due to the fact that the quartz crystals in the granite contain water within a hollow space; when heated, the crystals burst asunder and the rock rapidly pulverizes. It is also a fact known among geologists that most metals being scattered through the rock in grains, when a fissure

or crack is near by, said metallic grains are gradually forced into it by the solvent action of heated water or propelling force of steam in the heated depths of the sedimentary deposits or strata beneath us, thus forming veins of metallic ores so generally found. The rocks in the sedimentary strata are folded by sinking and rising in the shallow semi-fluid mass described, and the lateral pressure, the friction produced by these foldings in themselves, generate no doubt a considerable amount of heat near the surface.

“I will now leave this subject with you my friends. It is not a new one, but old, yet it is more recent than the old hypothesis, that we are walking upon a thin shell, covering a globe of liquid fire beneath us.” And as the speaker closed his argument, he was applauded to the echo.

CHAPTER VIII.

On the arrival of Lodo at his home, his sister informed him that they had been invited to an evening repast at the home of Selucea and when he had sufficiently rested from the labors of the day, they repaired thither. Quite a party of friends had assembled and a merry time was enjoyed. After dinner one after another contributed to the entertainment by telling an anecdote. It was Selucea's turn. "I don't like the 'holier than thou' disposition and it is well sometimes to be humbled. I am reminded of a minister who was out on a walk, he met three young fellows full of fun seated upon the bank telling stories; he accosted them and asked what they were doing.

"One of them replied, 'We are seeing which will tell the biggest lie, and the one who succeeds is to have this gold-headed cane; do you want to join us?'

"'Why, young men,' said the minister, 'I am surprised, do you know, boys, I never told a lie in all my life.'

"Instantly one of them yelled out, 'boys, give the minister the cane, he's won it.'

“ We are not apt to see the mote in our own eye,” said Trienna, “ and think we are cured of certain things when our neighbors are not, and that reminds me of two strangers riding together in a railroad car from Virginia to Connecticut, United States. They stammered, and says one to the other :

“ ‘ Where you g-g-going, sir?’

“ ‘ To Con-con-con-n-necticut.’

“ ‘ I see, you s-s-stammer, sir.’

“ ‘ Well, I do s-s-sometimes.’

“ ‘ Yes, I see you have a s-s-slight impedi-i-m-m-m-m-’

“ ‘ Hallo, w-w-whistle it, c-c-can’t you?’

“ ‘ Impedi-m m-m-m.’

“ ‘ Can’t yer w-w-whistle? s-sing it then.’

“ ‘ I’ve t-t-tried that, but it’s n-n-no use. I sometimes s-s-spell it out, but I d-d-do best when I g-g-get m-m-mad, then my t-t-tongue and b-boots fly f-f-fast.’

“ ‘ I do b-b-best when I keep my m-m-mouth sh-sh-shut, but what are you g-g-going to Con-con-con-n-nectic-cut-cut-cut-cudarcut for?’

“ ‘ To see Dr. S-S-Smith, they say he’s sure c-cure for s-s-stammering.’

“ ‘ Yes, I know the d-d-d-doctor, I w-w-w-went t-t-to him, and he c-c-cured me.’ ”

After the company enjoyed a hearty laugh, they turned to Lodo and declared that it was his turn, and he said :

“ We are yet human and we like to look at our faults at a distance. We don’t want to see suffering

too near. I am reminded of the Dutchman in ancient times who attended a protracted religious meeting. The minister did not believe in immersion for baptism and one night preached on the subject of baptism. In the course of his remarks he said some believe it necessary to go down *into* the water and come up out of it to be baptized. But this he claimed to be a fallacy, for the preposition '*into*' of the scriptures should be rendered differently, as it does not mean into at times. Moses," he said "we are told went up into the mountain, and the Saviour was taken into a high mountain, etc. Now we do not suppose that either went *into* the mountain, but upon it. So with going down into the water, it means simply going down close by, or near to the water and being baptized in the ordinary way, by sprinkling. He carried this idea out fully and in due season and style closed his discourse when an invitation was given to any one who felt disposed to rise and express their ideas. Quite a number of the brethren arose and said that they were glad that they had been present on this occasion; that they were well pleased with the sound sermon they had just heard and felt their souls greatly blessed. Finally a corpulent gentleman of Teutonic extraction, a stranger to all, arose and broke the silence that was most painful and said 'Mister Breacher, I ish so glat I vash here to-night for I has had explained to my mint some tings I never could belief pefore. We reat, Mister Breacher that Taniel vas cast into the den of lions, and cam

out alive. Now, I never could believe that, for the wild beasts would have eaten him up right off, put now it is very clear to my mind, he was shut close by or near to, and did not get into the den at all. O, I was glad I was here to-night! Again we read that the Hebrew children were cast into the fiery furnace, and that air always looks like a peep story too, for they would have been burnt up; put it is all plain to my mind now, for they were cast close by, or near to the fiery furnace. O, I was so glad I was here to-night! And then, Master Breacher, it is said that Jonah was cast into the sea and into the whale's belly. Now, I never could believe that. It seems like a peep feast story, but it is all plain to my mind now; he was not taken into the whale's belly at all, but was shut down onto his back and rode ashore. O, I was so glad I was here to-night! And now Master Breacher, if you will shut explain two more passages of scriptures, I shall be, O, happy that I was here to-night! One of them is, verily it saith the wicked shall be cast into a lake that burns with fire and brimstone, always. O, Master Breacher, shall I be cast into that lake, if I am wicked? or shut close by or near to, shut near enough to be comfortable? O, I hope you tell me I shall be cast shut by, a good way off, and I will be so glad I was here to-night. The other passage is, that which saith, blessed are they who do these commandments, that they may have right to the tree of life, and enter through the gates into the eternal city. O, tell me I shall get into the

.

city and not shust close by or near to, shust near enough to see vat I have lost, and I shall pe so glat I vas here to-night."

It was the practice in the time of Lodo to enjoy pleasantries immediately after dinner to aid digestion, as health in that era demanded the first and highest attention. After the fund of anecdotes had been told a discussion in ethics was held, and the brilliant display and masterly presentation of the subject by Trienna held spellbound the company before her, none of whom more highly appreciated the effort than Lodo. He gave almost breathless attention while she was speaking, and when she concluded he arose and with extended hand clasped hers and congratulated her earnestly upon her effort. He then engaged in conversation with her, inaudible to the rest of the company. This unusual attention attracted the notice of those assembled and none were more disturbed than Selucea. It was not with any angry feeling that she looked upon them, for she was a maiden of gentle disposition and pure heart, but it was with feelings of sorrow and disappointment that she viewed the scene. Lodo was her idol and she had prayed that the time might soon come when she would be first in his thoughts, but alas! this incident proved that it was more distant than ever. And yet, she thought as she reflected a moment, "why should he not be fascinated by Trienna, it is her profound learning which charms him, and what have I done? Nothing in comparison with her, for the advancement of science and philos-

ophy. Both are in continual search of knowledge ; like attracts like, and if I expect to win his attentions, I must seek learning and I will gain it." Animated with this determination she became more cheerful, and when the opportunity came she advanced to meet them with extended hands which each clasped.

CHAPTER IX.

“Fire! fire!” rang through the hallway and away Selucea ran, followed by Lodo. “In room 4, third story,” a voice cried. Lodo hastened up the stairs while Selucea in the hallway pulled a knob on a register of numbers and the fire was in a few moments extinguished.

In the fiftieth Epoch, great conflagrations were extremely rare, and why? Because the mechanical arrangements for the prevention of fires were comparatively perfect. In building most houses as was the case at the home of Selucea, a small hollow tube runs around the top of the walls of every room. In the tube are punctured holes a little distance apart and a small nozzle is attached to each, through which a spray of water is forced over every inch of the room, and in addition to this, a larger tube runs outside on the ridge-pole and on all sides of the house, just under the eaves. The tubes contain holes but a little distance apart, the same as already described inside the rooms, but larger, and at a moment's notice an electric button in or without the hall is pressed where electrical apparatus is in use, and when not, a knob attached to a wire is connected

with the main water pipe and in a moment the water is forced over the outside of the dwelling. When but a single room is to be reached the connection only with that room is touched and when the entire house is endangered, both the inside and outside faucets are opened, and the house is at once completely saturated. All buildings whether single or in blocks are further guarded against fire by the use of a kind of mortar into which is put a chemical preparation, giving the compound the same properties as asbestos to resist the progress of the fire. When the house is built the mortar referred to is used in the ceiling and walls of every room; it is also back plastered with the same.

Further precaution is also taken in large buildings, such as halls, manufactories, theatres, etc., to avoid panics. On each side or end of the building a section, five feet high and running the entire length of the hall or room, in each story, is built in such a fashion that it can be slid upward by mechanical appliances and the sides or ends of the building outside are interlaced with a heavy crossed wire frame, one foot mesh, on which the inmates can stand and descend step by step until the ground is reached. In this way all public buildings are emptied or vacated instantaneously and no building is allowed to be built by the city or town unless the above arrangements are complied with.

CHAPTER X.

A meeting of the Academy was announced for Monday night. Franco was to open the meeting and when the gathering assembled he began as follows: "To say that rocks contain life is radical I know, but nevertheless I launch the assertion. We say a thing has life that possesses the power to grow and develop. Rocks do not apparently possess the former quality, but the latter when we study their structure carefully and thoughtfully we find changes in their forms have been constantly occurring. Look at the pure crystal; has that not passed through a process of development, from the simplest amorphous rock to the highest crystallization? We say that is due to some chemical action, largely through heat. It is simply the manifestation of a force; not that heat is the force itself any more than the power of speech is the force. Speech is simply the manifestation of that force which is behind both speech and brain and unseen. So an unseen force is behind heat, the latter being simply the phenomenon, and not the power that prompts or propels it. Heat I do not regard as a link in the 'correlation of forces,' but a link in the primary manifestations of

force, correlated to each other, as light, motion, electricity, magnetism, etc. These are all resolved or reduced to one primary force, which produces said primary correlative manifestations.

“Spend an evening with the experimenter and watch his experiments in crystallization, as soon as the current of electricity begins to pass through a certain liquid, the wire becomes covered with bubbles, and foliage develops with the most extraordinary rapidity. The particles seem to form in the liquid, to come into existence from nothing and rush with violence to attach themselves in leaves and frond-like forms to the attractive wire. The general appearance of the tree is fern-like and graceful. Some one says ‘In the process of crystallization nature first reveals herself a builder. Where do her operations stop? Does she continue by the play of the same forces to form the vegetable and afterward the animal?’ Whatever the answer to these questions may be, trust me that the notions of the coming generations regarding this mysterious thing which some have called brute matter will be very different from those generations past.

“Life in each kingdom is differently developed. In the animal kingdom, growth of stature ceases at a certain age, while in the vegetable kingdom it continues through the individual existence of the plant. The former possesses the power to move from place to place at will, the latter is fixed to one spot, and derives its nourishment chiefly through the lower part of its organism while the sustenance of the

animal kingdom is taken through the upper. The resulting processes of these developments are easily explained, save the first, in the cessation of growth of man or animals at a certain age; and why said physical growth does not continue through life, as with the plant, is not yet satisfactorily explained. All of these processes and developments, however, are simply the results of some unexplained force which propels and gives shape and form to matter, not only in the animal and vegetable kingdoms, but in the mineral kingdom, which manifests itself, though differently, yet most distinctly in varied crystallizations. The differentiation in life is very marked in the development of our planet. To-day in man, more than all others in the broad realms of nature, dwell the greatest and the widest manifestations of life. Like the beast, he enjoys the powers of locomotion, self-defence, etc., but more than that, he enjoys an intellect as varied as it is great, and as far beyond the beast as the latter is beyond the oyster, or the oyster beyond the lowest form or manifestation of animal life. In the first, the most recent planetary development, man, we find the broadest variety; in the beast its development is less marked; in the oyster the differentiation in life is reduced to a very narrow limit; in protoplasm, the base, or the lowest round in the ladder of animal life, the variety of manifestation is as small as is possible to imagine in this kingdom. In the vegetable kingdom, differentiation is still less marked, for life is manifested only in reproduction and growth

with changing forms, while in the mineral kingdom, the variety of life's manifestations are reduced, not to its minimum development but to the lowest or narrow limit in matter as a solid; its manifestation, though less apparent than in the higher kingdoms, is nevertheless to the investigator, positive, for growth and change of form through crystallization is everywhere observed. Vegetation develops largely through the influence of heat; so does crystallization in the mineral kingdom develop largely through the same manifestation of force.

“A prominent scientist gives undue influence to the manifestations of heat. This element, he considers, is the vital force, the very life that animates our being and all matter; but with like consistency he might claim the same pre-eminence for oxygen, for without the presence of the latter, seed could never germinate, nor an egg develop into life. Another claims that electricity is the basis of life; but be it heat or electricity that animates the vegetable and animal kingdoms, must not we claim that through both of them the mineral kingdom develops and changes form through crystallization; but as previously stated, both heat and electricity are correlated manifestations of a force, not the force itself, that prompts the action; the latter we may call the vital element which animates the universe, giving life to rocks through crystallization and development to plants and animals through germination. To produce a good plant we must see that the soil contains those mineral properties which we know the plant

upon analysis itself possesses, for the plant is sir
a mineral or minerals with gases reproduce
developed, or in other words metamorphosed
vegetable life."

•

CHAPTER XI.

At the close of the meeting Lodo advanced towards Trienna and they engaged in earnest conversation. In a few moments they left the hall together. Selucea who had been a very interested listener to Franco's argument watched Lodo's marked attention to Trienna with much emotion and on her return home she fell into her mother's arms and wept.

"What is it?" whispered her mother, "pray tell me what so troubles my daughter."

"Trienna," she muttered in broken accents, "I fear has gained that for which I have so long sought, the love of Lodo."

"Be patient my child, it may not be. Visit him and find out the truth, if it is not true he will thank you for your interest, for Lodo is an honorable man and if true the sooner known the better, it is possible that he is more in love with her great learning than with any personal charms she may possess."

"You are right, and I will not only hope but work," and she retired to her chamber for the night.

When not engaged in the study and discussion of philosophical subjects, Lodo busied himself in agriculture, in fact, the agriculturist in this epoch was

esteemed more highly than he who followed any other calling, for the people realized that upon no one did they depend so much for the sustenance of life as upon him.

Said Leonia to Lodo, "I read that large farms were common in ancient days, while now they are divided in small areas."

"The population," said Lodo, "is too great to admit of large ownerships at present, and the facilities for cultivating the soil are now so much greater than then that every householder can attend to it. The hand hoe, the horse and cultivator were universally used in those times to cultivate the soil, while now farming implements are propelled by electricity, so that all one has to do is to harness the electric current to a machine or implement to stir the soil. When an acre or so is to be cultivated our electric plows and cultivators are used, but when only a few feet, or a rod or two, are to be cultivated a hand implement is used to stir the soil which is propelled by an electric current."

"I should not suppose," said Leonia, "that the ancients could have accomplished much in agriculture without the aid of electricity, how did they make a living?"

"They did make pretty hard work of it. It cost them too much bodily labor. Most of their time from sunrise to sunset in seasons of plant growth was spent in keeping the weeds out, and in general cultivation, while now our electric implements do the work quickly."

“What progress has been made,” said Leonia; “even in the care of our little bed of flowers we have now but to guide our electric tool, and the soil around each bush is thoroughly stirred. By the aid of electricity we accomplish our agricultural labors so quickly that most of us have all the middle of the day for study or the performance of any other duties that most interest us. We read that in ancient times horses were in general use all over the earth; since electricity has been so generally applied to propel nearly everything, horses are in but little demand. Even cows,” said Leonia, “were kept extensively by all nations of the globe in that epoch, now they are rarely seen. Why are they not kept at present?”

“Because,” answered Lodo, “milk is manufactured by a chemical process which is considered as good and nutritious as if fresh from the cow.”

“Then why,” questioned Leonia, “did they not manufacture it in those times instead of milking it from cows?”

“For two reasons; first, they did not possess the art to manufacture it; and, secondly, if they had acquired the knowledge they would have obtained it more cheaply through cows. And again, we have no pastures to feed them, land is too valuable, every acre must now be cultivated to raise crops sufficient to feed the crowded population.” At this point of discussion Trienna entered the study and was warmly welcomed by Lodo.

“Don’t let me interrupt you,” said Trienna, “you and your sister were discussing some question?”

"Yes, my friend," spoke Leonia, "we were discussing Ancient Agriculture, and just now the manufacture of milk."

"Do you not think, Lodo," said Trienna, "that the manufactured milk of to-day is far healthier than that they obtained from cows?"

"Most certainly; much disease was incorporated into the human system by drinking milk from cows. Animals suffered from disease the same as man, but it was not so apparent, because they could not so easily make their sufferings known, and then humor could not be as readily observed on account of the thick covering of hair. A person drinking milk taken from a diseased cow is very liable to take the disease, and through ignorance or thoughtlessness in those days they failed to trace its source."

"But," said Leonia, "cows fed in pastures ate the food of nature which ought to have kept them healthy."

"Very true," answered Lodo, "if that practice had been followed without any change, all would have continued well and good, but as the population increased, and pastures around thickly settled places became fewer, they began to feed them with unnatural food, and in the craze to get the most milk out of each cow they overfed them, cramming and forcing them to the utmost, and so, deprived of the free exercise that nature provided them on ranches and pastures, their milk gradually became unhealthy, and even many of those cows that were pastured, were forced to that extent by high feeding in the

barn, as with grain stimulant mixtures, that the cow became diseased and the milk impure, though imperceptible to the chemist or inspector. It was a common thing in those times to force cows near cities to that extent that they would not last more than two years and at the most three."

"But," said Trienna, "I should suppose that the chemist would have been able to detect anything wrong."

"So it would appear," answered Lodo, "but they did not trouble themselves much about it. When ensilage in that era was being introduced and grown and preserved in its green state in silos, one and all of the chemists pronounced against its intrinsic value in agriculture, said it was largely water and cows would not do as well upon it, but the cows knew better than they, it increased their flow of milk and fattened them, and proved to be a healthy food. The ensilage contained something chemists could not fathom, and that something was what the cows wanted."

"Beef, I read," said Leonia, "was one of their principal articles of food; what would those beef eaters do could they have jumped into our era to-day, where beef eating is unknown?"

"Of course, it was found ultimately that beef became diseased, not, however, until ranches and pastures, as the population increased, ceased to exist. Grass is not grown so much as formerly because cows and horses are rare."

"Before you entered, Trienna, we were discussing

the methods of growing crops as compared with ancient times. Of course, in the absence of cows and horses we are obliged to use chemicals instead of barn manures for a fertilizer. In past ages the agriculturist depended largely upon the latter to grow their crops, and when they did use chemical manures they did not use them understandingly and economically, but now we have become so thoroughly acquainted with the composition of our soil, the plant and the laws of plant growth, that we know just what chemical food the plant requires in a given soil, and we rarely make mistakes. It is not found out by the analysis of the soil, for that is impracticable, but in testing the soil by experiments."

"I don't quite understand," spoke Leonia, "how that is done."

"Every farmer is familiar with the process," said Lodo. "A plant is made up largely of three prominent factors, nitrogen, phosphoric acid and potash. Now some soils require the addition of all these to make a plant thrive, while other soils have enough of potash but are deficient in nitrogen and phosphoric acid, while others have sufficient phosphoric acid but not enough nitrogen and potash, and the best method to ascertain this fact is to apply to one plat of ground, all the three chemicals referred to; and to another with the same seed apply nitrogen and phosphoric acid, leaving potash out; to another plat nitrogen and potash only; to another potash and phosphoric acid; applying to all the same seed, giving the same care and cultivation to all the plats, and

watching the growth, and so find which plat yields the best. At the planting of the next crop apply those chemicals that produced the greatest growth and yield, and by continuing these experiments through the field, year after year, the requirements of the soil to produce the greatest results becomes pretty thoroughly known, and thanks to our great artificial water supply, in the absence of sufficient rain, our gardens and fields are irrigated and the certainty of good crops can be relied upon."

"We read," said Trienna, "that in the thirty-fifth epoch fruit grew to immense size. Apples weighed a pound; pears were of equal size; peaches were nearly as large; a single grape filled the mouth; strawberries were sometimes from eight to ten inches in circumference; while in our epoch such fruits are small."

"That is due, my friend," said Lodo, "to several causes. In ancient times the budding and grafting process was carried to such an extreme point that the trees and vines in time became exhausted of the energy to produce these unnatural mammoth fruits, and then again they were coarse and of poor quality as compared with the fruits of to-day; although ours are small they are superior in excellence of pulp to any that the planet has ever produced. We never aim at size, that belongs to the past; quality is what we want and what we obtain. The same is true also of flowers; size was considered the great desideratum among the ancients, and it was carried to such an extreme that the energy in reproduction became

weakened, and not until the florist returned to the first principles of nature's methods did the exhausted energies of the cultivated flowery kingdom recover. Now the flora is cultivated more for beauty and fragrance than for size. The delicacy of color to-day is unsurpassed by that of any age. The corolla is richer in texture and complexion; the calyx is of a deeper green and more varied in color, the pistils and stamens, with their anthers, are more distinct and regular in their outlines, and the leaves are more sessile and the petiole not as stout. The flower of to-day, though simpler in its dress and smaller in size, is brilliant and the quintessence of beauty."

CHAPTER XII.

Said Trienna, "It was my good fortune to attend, on Tuesday night, the great banquet. The floral decorations were magnificent. Hanging in festoons from one end of the hall to the other, literally covering the ceiling were tiny leaves, emitting a silicious substance which sparkled in the electric light like diamonds, presenting on the ceiling above a firmament as brilliant as the evening sky, with the stars of the 'Dipper,' Pleiades, Orion, Lyre and other constellations radiant in their beautiful scintillations (and at an angle of 45 degrees). The North Star was seen twinkling at the helm. During the evening the lights were lowered, and all at once a single light burst forth in these artificial heavens, with all the intensity of the noon-day sun and like it in appearance, while at the other end of the hall gradually came into view a rainbow with all the beautiful and brilliant tints that are seen at approach of eve after a summer shower; and these were made up of flowers, and so hung upon the walls as to present this charming view. Upon the hair of some ladies were scattered dots of flowers as brilliant at times as diamonds, and upon the light dresses of others were

scattered other flowers, as blue as sapphire and flashing at times with the brilliancy of that gem, while upon others little gems of flowers representing emeralds, pearls, garnets and rubies were scattered here and there, while the fragrance from these was exquisite. It was a brilliant affair."

Dinner was announced and after partaking of the meal, Trienna challenged Lodo to take a walk which he very readily accepted; they had not proceeded far when they met Selucea with a book or two under her arm, and seemingly in haste. She saluted both pleasantly and passed on, but when out of sight tears came, notwithstanding her efforts to check them.

Said Trienna, "Lodo, I would like your company this evening to a meeting of the Young Folks' Improvement Club."

"Thank you," answered Lodo. "I shall be pleased to accompany you," and they went. The discussion this evening was upon "The march of improvement in food supplies," and after a brief discussion Trienna was invited to speak.

She said, "We read that in ancient times, beef and pork formed the principal part of the inhabitants' food; it was considered to be the most strengthening of any diet, and yet to-day those meats are never or very rarely seen upon any table, but we are as strong in proportion to our size as they, and perform seemingly greater feats of strength than they. We make our brains, however, do the work in using mechanical appliances for lifting and moving, and save our bodies from useless strain and energy.

Our diet, consisting in part of eggs, poultry, birds and fish, gives us all the animal food we desire, and then through the continuous labors of chemists for ages we have reached the high-water mark in food nutrition. Our diet is all that can be desired. It gives us strength for body and mind, it is easily digestible and very palatable. Hygiene is familiar to all; children are interested in it. Nothing is taken into the system by the masses that is pronounced injurious. Nothing is neglected in the diet that conduces to building up the system."

Other points were advanced by her, and at the close she was applauded. At the adjournment of the meeting she and Lodo returned to their respective homes. Trienna had invited Lodo to accompany her on the following morning to Structo, distant a couple of hundred miles, to attend a meeting of the Academy, and he had accepted. The journey thither would occupy but an hour and a half in the aerial car, by which they would be enabled to reach home again early in the afternoon. In nothing had there been a more complete revolution than in the mode of travelling. Travelling in the air was now the only method adopted in riding long distances. Vehicles in the air are as abundant as were carriages on the earth in former times. For many centuries the navigation of the air was made a study and failure after failure was the result; but in the course of ages all the obstacles were overcome and the great desideratum became an accomplished fact. The aerial car is not a flying machine or a balloon, but it embodies

both. The structure of birds and their flight and the properties of matter with reference to aerial machines were studied, until the problem was solved. Machines made of strong but light substance, through which run numerous tubes filled with a buoyant and etherial substance, and constructed outwardly as inwardly, like a bird, with wings flapping in the sky and dimensions as broad as the sails of a ship, while the wing sails play horizontally instead of vertically, as sails upon the ocean. The aerial train of cars differs from the train upon the land in locomotion, in so far that it is not propelled by a leader or engine, but each car propels itself. The cars vary in size, some carrying a hundred persons, and other vehicles small enough for one or a dozen only. Heavy freight is conveyed mostly upon land and by water. Aerial conveyance is for the accommodation of the people, also for light freight and rapid transit. For the conveyance of freight pneumatic tubes are used, the diameter of which varies from one to thirty feet. A voyage across the ocean is made in the aerial car at the rate of a thousand miles per day. The conveniences in the cars for sleeping, toilet, eating, reading and writing are perfect. Accidents are very rare. Vehicles are so constructed that if by any accident anything should stop the action of the sail wings, the buoyancy of the tubes would keep the car suspended. The action of the wings gives the onward motion to the car, and the buoyant principle in the tubes suspends it so that both of the forces of the machine must be de-

stroyed before it can fall to the ground, and this is remedied by an extra buoyant and wing force, held in reserve, which can be instantaneously applied. Then again the bottom of the car is built of an elastic substance in the interior of which is a large air chamber, which so lessens the shock in striking the earth that it is not fatal to life. Repairing apparatus and materials are always carried on the car. Electricity is used to propel the machine. In the heat of the summer journeys are made in the aerial car to mountain summits, making a delightful trip.

CHAPTER XIII.

Selucea at supper said to her mother, "I was surprised to learn yesterday, the romance connected with the life of Trienna. I will give it to you as it was narrated to me.

"On the banks of the La Platte, dotted with factories, stores, elegant mansions and churches in the town of Calco, was seen on a bright summer's afternoon a procession moving with solemn mien to the distant churchyard. It halts, six men with hats removed lift from the hearse a long casket and deposit it on the bier. It is taken into the churchyard to be deposited in a temporary vault. The procession is a half mile in length, made up of factory girls and men, citizens, rich and poor, all bearing countenances filled with sorrow, as if the occupant of the casket was some near and dear friend with whom they were all loth to part. It was true, he was a dear friend and his death a great loss to the town. He was a manufacturer and employed a great many women and men; he was the life of the village and country, and the citizens sadly mourned his decease, for what greater earthly loss can a community meet than the hand which bestows upon it

justly, although for value received, the means that contribute to the support of life. Such was D'Carlo, a bachelor, who left two married sisters, two nephews and a niece. After the funeral, the will was read. He left to L. and I. H., his nephews, and L. M., his niece, one thousand dollars each, and to D'Carlo, 2d, (his namesake and nephew) one thousand in cash, and also the residue of the property in trust, to be invested for him, and neither the principal or interest to be used until said D'Carlo, 2d, arrived at the age of thirty years, at which time, if he was living, he was to be paid the principal and accrued interest. If not living and without issue, the principal and interest shall be paid to his next oldest nephew, Lodo, if living, and if not, then equally divided among his next of kin.

“ Said D'Carlo, 2d, had just passed his twenty-first birthday, and with his legacy and prospective fortune his ideas of life broadened, and he revelled in the thought of the good time coming. He grew independent in thought and in deed, and felt that he was lifted into eminence by being made the residuary legatee of a large fortune. He was filled with self-conceit. For a year or more this D'Carlo, 2d, was paying attention to Trienna. He was desperately in love with her and it was reciprocated. As time rolled on his prospective fortune threw him into society. He was soon surrounded with friends, some of whom did him no credit, and to those he seemed more attracted than to the soberer sort; such attraction is natural to one who looks upon life as made up of fun and play

without work, and into these habits and thoughts young D'Carlo was fast drifting. Trienna saw this and lamented his choice of associates and the path he unconsciously was following. She advised with him and counselled the discontinuance of these associates, but in vain, they had too strong hold upon him. His parents endeavored to keep him at home by making it attractive. They prepared some sort of entertainment for him every evening, but alas! they commenced too late. His habits and associates were formed, and he was repeatedly found a patron in the lowest dens of vice. Trienna led a pure and exalted life. She worshipped goodness and nobleness of purpose in all its forms, but evil thoughts and evil doings she rebuked, and detested the man or woman who would harbor or practise them, and it came to pass that D'Carlo grew repulsive to her. She was not organized like some women, rare in society, who could pursue the man she loved through good or evil, come what may, with the hope that some day through continued efforts he might be redeemed. It was sufficient for her to know that he was bad now and that destroyed all the love for him within her. She loved goodness for its own sake and when rooted in an individual, she idolized it.

“It mattered not to her what the people thought about it, she followed the bent of her own convictions and was true to them. Reputation was nothing, but character which is the tap-root of a man's being was everything. Not what a man seemeth, but what he is, was her motto. It was not because an act or

thought was disgraceful in the eyes of others that she loathed it, if the idol of her heart was true and sincere, though he was suspected of evil, it made no impression upon her; if in her eyes and God's he was right, she would follow him to the end unmindful of the consequences. She was heroic, but when her affections had been placed on one who was an apostle of vice she must abandon and leave him to his fate, and when they met again the following conversation took place: 'But you have already given your promise to marry me,' said D'Carlo, after an earnest talk with her alone, seated at her side in the drawing-room at home. 'It is true,' said Trienna, 'I did promise a year ago to marry D'Carlo and I stand ready to-day to marry the man I then met; the D'Carlo I loved a year ago was upright in bearing, pure in thought and in deed, virtuous and with character unimpeachable—that was D'Carlo; where is he now? dead to me. He lives only in my memory of the dead past. I loved him and then rejoiced in the fond hope to one day wed him, but the man who calls himself D'Carlo to-day, I loathe; he is wedded to vice and dissipation. I know him not. Adieu!' and this is her romance."

CHAPTER XVI

After the engagement was renewed, Trienna engaged in the study of philosophy and sciences and became as we have already seen, very prominent in them.

We have also recognized the fact that there has sprung up without any apparent effort on the part of Lodo or Trienna a mutual interest in each other, brought about at first by their interest in philosophical subjects. D'Carlo, notwithstanding the long broken engagement, could not shake off his attachment for her and he followed and watched with a jealous eye all of her movements, and when she and Lodo became interested in each other he could hardly restrain himself from some act of violence, and plunged deeper in dissipation. He determined to destroy this growing attachment displayed by Trienna to Lodo. He sent the following letter to Lodo:

"You are receiving unusual attentions from Trienna, who long ago promised to be my wife. Discontinue at once any further attentions to her or I will get satisfaction at any cost.

"Yours, etc., D'CARLO."

Lodo made no reply and Trienna continued her

attentions to him, which he did not feel called upon to reject.

D'Carlo watched his movements, and filled with mad jealousy he determined to put him out of the way. National and international disputes being settled by arbitration in this the fiftieth era, nearly all disputes between individuals were settled in the same manner, but there were some exceptions. Here as in everything else a few were constitutionally bad, had no moral stamina and could not be reached in that way. D'Carlo was one of them, and two or three of his associates.

Not receiving any reply from Lodo, he watched his opportunity. Having charge of a pneumatic tube station where freight was transported to local and distant points, he, with two associates in ambush, seized Lodo while passing near the station. They dragged him to the side entrance of the tube, unlocked the door, and after a desperate struggle succeeded in forcing him within. The latter was well aware of his fate did they succeed in their plot. He knew it was certain death, for once in the tube as soon as the electric lever was put into operation the air would become exhausted, respiration impossible and he would be sent with lightning speed to his destination; but while D'Carlo and associates were struggling to force him into the tube and before D'Carlo could apply the electric, Lodo, who had just come from his laboratory, suddenly remembered that he had in his pocket an explosive on which he had been experimenting. As soon as he was forced


into the tube he ran forward a few steps while the door was being closed and threw the explosive a rod or two at the side, as it was life or death with him and he was willing to take his chances.

It exploded, and a rent was made in the tube through which he made his escape. One of the fragments struck D'Carlo in the leg and he fell. His friends rushed to his aid and Lodo seeing the injury to D'Carlo ran to his assistance, but the latter perceiving the movement motioned him away.

"Don't come near me," he cried, "out of my sight, I will be even with you yet," and Lodo hastened home.

D'Carlo was conveyed home and circulated the report that Lodo conspired to kill him by exploding the pneumatic tube, near which he was stationed, in order to rid Trienna of his presence. The neighborhood was filled with excitement at the recital of the tragical affair and some believed that D'Carlo's story was true. Trienna, filled with anxiety and doubt as to the reports against Lodo, hastened to his home and met him in his library. "Oh, Lodo," said Trienna, "how I have longed to see you, do tell me about your connection with that explosion which injured D'Carlo," and she placed her hand confidently in his as he told the story.

"I believe you, I knew you could not and did not plot against his life," she said, as she looked up into his honest face. "D'Carlo is bad," she continued, "thoroughly bad, and yet how could he be so cruel to you, who never did him harm," and she departed.



When Trienna reached home she determined to make the facts in the case public and she did what she could to correct the bad impression current about Lodo's part in the affair. Among the more intelligent and better classes who recognized the true worth of Lodo, his great learning and honest bearing she succeeded in proving his innocence, but with the less learned she failed to impress, and she became unpopular with them.

D'Carlo in a few days recovered sufficiently from the effects of his wound to go out and was soon well. The shock and injury which would reform most men did not cure D'Carlo of his mad jealousy. He took encouragement from the sympathy of the few for him and planned with his fertile but frenzied brain to rid Trienna of Lodo's presence, in whose company she was often found, notwithstanding the late unfortunate affair.

Lodo's movements were closely watched by D'Carlo, and he found that the former at dusk was in the habit of walking over the bridge spanning the river La Platte. D'Carlo accompanied with two friends secreted themselves in a niche upon the bridge and at the approach of Lodo in the dim twilight they sprang upon him, with the purpose of throwing him into the broad river below. Lodo, a heavy, closely built, muscular man, yet very quick in his movements, instantly comprehended what his antagonists were about to do; he drew upon every muscle and sinew of his body and struck out straight from the shoulder. His fists flew back and forth

with the rapidity and precision of a piston-rod and two of the assailants were rolling upon the floor of the bridge. D'Carlo remained; he was not so easily vanquished. He was larger and apparently stronger than Lodo, he was quick in his movements and Lodo had his match. They grappled, and knowing it to be a struggle for life, Lodo lost no time. Both went down with D'Carlo on top. They were close to the side of the bridge, which had no raised edge to keep them from rolling off. D'Carlo yelled, "Now I've got you, go!" and with a herculean effort he lifted Lodo up to roll him off, at the same time attempting to detach himself from him, that he might escape being dragged, as Lodo fell into the river, but with the agility of Achilles, Lodo, who had not lost his presence of mind, grasped D'Carlo by the throat with a terrible grip which loosened his hold and in the struggle to regain the mastery D'Carlo falls into the river and Lodo only saved himself by clasping a post close by. During the struggle the other two antagonists had not sufficiently recovered to assist D'Carlo, and when they did rise it was only to see their friend fall, but too much punished and frightened to attack Lodo, they escaped and left him alone.

During the struggle, a woman approached the other end of the bridge, she halted, she witnessed the last throes of the struggle. She saw D'Carlo fall in the river, she recognized Lodo in the distance, and with a shriek she fled. Lodo as soon as he recovered himself, looked into the river and in a

moment more he hastened with all possible speed off the bridge and around to the shore. He looked toward the spot where D'Carlo fell, it was getting dark and his vision was clouded. He again eagerly looked but failed to see him. A sail boat was anchored a few rods away and he waded to it. He discovers a chain and pulls upon it, and finds to his sorrow that the chain is not attached to an anchor, but to a rock on shore and locked. Other boats lay at anchor, but too far away. He cries, "Great heavens! is there no way to save him?" He throws off his garments and in a moment he is in the deep waters. He swims in the direction of the bridge, he recognizes the spot where D'Carlo fell, he swims here and there, but discovers nothing; he throws up his arms in despair and is indifferent to the safety of his own life, but thoughts of sister and mother and of Trienna revive his energies and he renews his struggles to gain a boat yonder. He nears the boat, his hands clasp the side, he springs, but losing his grip sinks; he rises and once more seizes the boat, he climbs into it, blinding darkness clouds his brain and he falls back lifeless. An hour passes and consciousness returns, he raises himself to fall back again helpless, and a half an hour more he moves, and with some effort stands. He dresses and feebly wades to the shore. He looks despondently about him, and speaks, "What a terrible dream! was it not a dream? What! n—no? not a dream? it's true. I struggled to save him, but too late, it was not to be. Where shall I go? home, where else? *there is no other place for me,*" and

homeward he slowly directed his steps ; he reached it and with much effort he creeps silently to his chamber and falls exhausted upon the bed.

On the following morning the parents of D'Carlo become alarmed at the absence of their son, they make enquiry during the day, but find nothing of his whereabouts.

At the home of Lodo all is quiet. As he did not appear at breakfast his mother sped to his chamber he awoke, she saw he was in trouble and sought an explanation. He told her everything as it transpired, she kissed him and sat silent in tears. Leon entered and as the narration of the event was repeated she spoke hopefully to him and trusted for the best in the powers that be. She said, "Lodo, would that you had never seen Trienna that you might have escaped this tragical end." The day passed on and towards eve a letter addressed to Lodo was carried to his room. It was opened and read as follows:

"Lodo, your crime has been discovered. Two men on the bridge saw you throw D'Carlo in the river and have just made it known to his parents and to the public. Your life is in danger flee at once. I unfortunately saw the tragedy as it approached the bridge ; would that I had not witnessed it, but alas ! 'tis too true. Oh, why did you do it? My faith is broken, we must part forever. Flee ! flee ! and at once, or it will be too late.

"Yours, etc., TRIENNA."

Lodo arose from his bed, dressed, and after bidding farewell to his sorrow-stricken mother and sister he went out into the night and away, far away

CHAPTER XV.

During the following day, after a sleepless night, Leonia and her mother were surprised by the entrance of one whom they little expected to see. She had been away to a neighboring State for many months; it was Selucea. She looked about and spoke: "And is Lodo not here?"

"He is not," answered Leonia.

"Where is he?"

"We know not," and Leonia and her mother wept.

"Cheer up," said Selucea, "he shall not suffer, I will follow him, he could do no wrong;" and their faces brightened.

Said Leonia, "You don't believe him guilty then?"

"Certainly not," answered Selucea.

"Bless you for that," said Leonia, and she embraced her. "It was not Lodo, he did not kill him. It was D'Carlo who tried to kill my brother and in the struggle fell off of the bridge. D'Carlo's friends who were present report against Lodo, and then Trienna saw from a distance D'Carlo fall into the river. She believes brother guilty and as the evidence was so strong against him he thought it wise to get

away from the tumult of the hour, not that he feared to remain, but as his word in court would not stand against three living witnesses, it seemed better to be away until the excitement had passed, until a calmer and more unbiassed judgment gained possession of the people, so as to allow the presentation of the facts and fair, impartial hearing given them. When that time arrives he will return, but until then he will live in secret. Oh Selucea, could you but have gained his affections instead of Trienna, he would have escaped this terrible ordeal."

"Trienna," spoke Selucea, "should have trusted him, and her faith in his innocence should have remained unshaken if she truly loved," and with these words she departed.

As soon as the community heard of the unfortunate affair they at once set about and dragged the river in search of the body of D'Carlo, but were unsuccessful in finding it. Vessels were plying up and down the deep and broad river, and though enquiry was made of the captains, no trace of the body could be found. The untruths current about the explosion affair, and believed by some, strengthened the prejudice against Lodo, and even those who believed him innocent of any malice in the accident could not see their way clear in believing him innocent in the bridge tragedy after what had been said by the three parties who witnessed the act, and then again, there were some who believed Lodo guilty, because if D'Carlo should die before the age of thirty his uncle's will gave the property to Lodo.

Most of the people were just and had no faith in such mercenary motives, and if Lodo had been caught and arrested there would have been no violence used or none allowed, as in this era no such an organization as vigilance committee or lynch-law could live; the few bad, dissipated and demoralized blots had not the slightest power over the masses. As long as humanity moved upon the face of the earth such beings existed and the millennium even in this remote era was not reached, for that would not be finite, human; perfection is God and He is infinite, but justice was triumphant and controlled the masses, and had Lodo been found guilty he would have been dealt with justly, or in other words it might be said, that they were painfully and scrupulously just, so conscientious were they that everybody should have their deserts, for good or evil.

Every effort is made in this era to capture and arrest the suspected criminal, no stone is left unturned, though years are spent in pursuit. The detective force is under control of the government and the officers are educated for this service as much as a physician is educated to heal the sick.

CHAPTER XVI.

At a meeting of the Academy, the social problem or the distribution of wealth, and the labor question was introduced and a series of meetings were held to consider them. The subjects were not taken up singly but collectively.

Said Franco, "If we go back to the thirty-fifth epoch we will find that the same questions were agitating the minds of the inhabitants in that age as they are to-day. It only proves that we are all human, and if the world should exist as many ages in the future as has marked its existence in the past, these problems would not be settled. It is not in the nature of things that they should be. To be sure, civilization is marching on, as it always has. The masses are better educated, that is to say, in the arts and sciences, but our general knowledge of every-day things in life is not much in advance of the ancients. Much knowledge enjoyed by them has been lost; and we enjoy much of which they were entirely ignorant; on the whole, we are considerably ahead in the march of civilization.

It has taken ages to bring the lower inhabitants of the earth, once known as savages and barbarians,

to the level of common intelligence, and that has been the work in which the advanced guard of civilization has been engaged. We have no tribes or nations upon the earth to-day who are not enjoying a common education. We cannot say that their moral culture has advanced in the same ratio as their mental. Somehow the two do not travel in the same line, and they never did in the history of any age. We have to-day, as they did among the ancients, men and women standing in the front rank of mental culture, whose moral status is below the average. Take the masses of the globe and they are rising to a higher level in morality, but there is now, and there always has been and always will be, individual cases of men and women who cannot or do not control their passions. One of the auditors arose at this point and said :

“ I believe there will be a kingdom of heaven on earth as well as in the world above.”

“ So do I,” answered Franco, “ for all who live pure and unspotted lives, but there are plenty of them who do not and will not. Man has two natures, the animal and spiritual, and there are many who are so harmoniously organized that both natures are under perfect control, but there are, and will be, some whose animal nature is the strongest, and they yield to temptations though their intelligence points the error.”

Trienna arose and said, “ We have made a great advance in both mental and moral culture through the careful selection of partners in wedded

life. In the distant past more pains were taken in the selection of parents of domesticated animals than in the proper selection of parents with the view of producing an advanced type of children. Fabulous sums, we read, were paid for the progenitors of fancy stock, while the maid or young man would wed with as little thought as to the inheritance of their offspring as the hen has in the production of her chickens. In this era there has been a great advance. No thinking and considerate man or woman to-day would think for a moment of uniting in marriage, without reflecting as to the influence such a union would have on the disposition, the physical, mental and moral worth of their progeny and the result is an improved race or races. There are some who do not act upon this principle, but they are, I am glad to say, in the minority. Then again, women are more independent than in ancient times; then we read, woman married for a support, to-day no such a state of things exists. She is as capable of self-support as man, and does not feel the slightest need of marrying for that object. She is independent and not dependent."

At the conclusion of Trienna's remarks Franco arose and said :

"The millennium will not be reached in this world. Wealth is devised or acquired, honestly and dishonestly, its distribution is governed by the disposition of the possessor. Educate him or her to be generous and you have the only lever that you can work upon to distribute it; we have succeeded in

part, but only in part. Money is now, has been and always will be a root of evil, but not *the* root and not *all* evil. We give the accumulator of wealth a certain length of chain, beyond that he cannot reach. Wealth is here limited. We read of the ancients that there were capitalists, or rather speculators, who accumulated the enormous sum of two hundred million dollars, that cannot occur to-day. At that time they made what they termed 'corners' in staple articles of food, and the consumers had to suffer, that the speculator might fill his pockets. In that era enormous trusts and pools were formed in all kinds of merchandise, railroad and other monopolies, to the injury of the masses and the aggrandizement of the few. They carried it to such an extreme that the wealth of a nation was centred in a few individuals and this gave them an immense power; they ruled and ground the middle classes into poverty and the poorer classes into servitude. When this miserable condition of things was reached the people arose en masse and a revolution followed; the struggle was long and severe, for the rich were slow to surrender; but it at last came, not, however, in the entire confiscation of their property, but in a wise distribution of a large part of it to save the masses from starvation and abject poverty. After the revolution was over and lives and property sacrificed, then followed legislation upon the acquisition of wealth. All trusts, combines, pools, monopolies and like movements were blotted out of existence. Laws were passed making it a misdemeanor and con-

fiscation of property for any man or body of men to be engaged in any form or manner in such plots to bleed the masses, and enrich themselves. No one deems it safe to engage in any movement to rob the common people of their proper share of the world's goods.

"To be sure we have the rich with us to-day, that is proper and allowable, if property is fairly earned. Nothing could be farther removed from wisdom than to attempt by legislation the cessation of accumulated wealth, but excessive and unfair accumulations as existed in the thirty-fifth epoch were prevented by the passage of those laws just mentioned. To stop the entire accumulation of wealth would be to stop the prosperity of any town or city; for the bright, smart and energetic must have some reward for their industry and savings, that is wealth, and God never intended to divide it among drones and spendthrifts. Labor is now considered respectable. Capital and labor work together harmoniously. The laborer understands that the capitalist must get fair remuneration for the risks and use of his money, and the capitalist understands that it is useless to crowd the laborer below a fair living compensation. Labor and the use of money regulate each other without any friction. One is dependent upon the other and neither can thrive continuously alone. A great advance in mental and physical labor has been made by the study of one's fitness for any given occupation, and this is called 'Vocophy.' No man or woman to-day thinks of adopting a vocation with-

out consulting a vocopher, to learn what profession, trade or occupation he or she is best fitted to follow. If one is ill-adapted to the pursuit he is following, he or she can never reach success."

One of the audience arose and said :

"I sometimes think that we are wrong. I don't know as I want anyone to tell me what pursuit I had better follow. I can do that myself. I believe I know more about the occupation I want to adopt and my fitness for it than anybody else."

Said Franco in reply, "It does not follow because one has a fancy for a special pursuit and a desire to follow it that he should adopt it. He should first ascertain whether he possesses the qualifications requisite for its successful accomplishment. To be guided solely by one's preferences would be folly ; for many with very ordinary abilities would try to become statesmen, merchants or philosophers, and alas ! what sad failures. As well might they attempt to pluck the moon from the sky as to fill any position with success without the necessary adaptation and ability."

CHAPTER XVII.

On the foot hills in Arizona, in the town of Bilk, there is an extensive silver mine abandoned ; but in the fiftieth epoch it has been again re-opened with the hope of finding more of the ore that past miners had overlooked.

There did not appear to be much ore left in this age ; but the wonderful advance in the facilities of mining made it possible to obtain ore that could not be economically mined ages ago. Let us descend one.

Word is given to the engineer and you are lowered in an iron car and fall about a thousand feet a minute. We alight from the car and follow the guide in the levels. The underground traveller, explorer and miner visits, of course, the interior at the peril of his life ; for not only does his life hang upon a cord by which he is lowered down hundreds of feet into the earth, which often breaks, but he is liable to suffocation by gas generated from the sulphates abundant in most mines ; he is also liable to be drowned by the inflowing of the underground streams and the sliding and caving of the rocks which form the roofs of the streets and chambers.

These mishaps formerly were of constant occurrence, but in the epoch we are describing they were not as frequent.

Every possible safeguard for protecting life in the mine is introduced, and yet when a mine ceases to yield fairly well the company neglects, often at the cost of some lives, these safeguards which need constant care and repair. In the levels, just mentioned, the rock or ore is separated from the ledge by blasting and picking, and then shovelled into a chute, an inclined channel or scoop, at the bottom of which is a slide and an empty car placed underneath to receive the ore or rock when the slide is opened. Often the ore is shovelled directly into the car. The car on the track is then pushed along to the shaft and by pulling a wire which extends up to the surface, attached to a gong or triangle, the signal or alarm is given to the engineer above ground. One pull is given resulting in one alarm when ore is sent and three alarms when men are to be sent up. This distinction is made because the engineer is obliged to run much more carefully and slowly when human beings are on the car than when there is ore. All the propelling in the mine and above is by electricity. After running tunnels or streets from the levels and abstracting the ore the miners commence to work up, or over their heads, which is called stoping. They work up an opening of perhaps twenty feet, and then work each way laterally in various directions and remove the ore by dropping it through a chute to the level below.

The miner of the thirty-fifth epoch carried a candle in his hands or in his hat, groping about in comparative darkness, but the miner of to-day, by the aid of electric lights fixed here and there, attached to movable insulated wires, can readily see his work. But, nevertheless, he is underground; accidents are liable to occur at any moment. Here are a lot of miners at work at the level we are now visiting, what are they doing?

They are removing a pocket of ore and opening a great chamber, as large as the interior of an ordinary hall. As you look at this group of miners there is one of them head and shoulders above the rest, mentally and physically. It is difficult to catch his eye; he is shy and diffident, his back is toward you, but there is something in his carriage, his movements that attracts your attention; his form is majestic, he has the bearing of a king, yet his dress is that of a workman, and there is nothing to distinguish him from the rest. Listen, he is giving in a subdued tone commands to his fellow workmen, and they move like automatons to his bidding. Step back a little as a large piece of rock falls below.

The guide says, "This man is the superintendent of the mine," and is the brainiest man he ever saw. He is valuable to the proprietors. He is introducing improved methods, and where there is any ore to be found, he is pretty sure to find it.

They have been making wings in side entrances, by stopping into chambers above for introducing drafts and currents of air. From the other surface

they have sunk two shafts instead of one, for in all well regulated mines there are always two shafts to create a current through the mine ; good, cool air descending in one, and bad, warm air ascending in the other. Hence in the main streets of the mine, where the current passes, it is comparatively cool, with the temperature perhaps at a hundred, but in the recesses, out of the draft, it is terribly hot, about 140 degrees. Water is nearly boiling. The men work but a few minutes at a time here, and then pass into the streets to cool off. Our friend remains in the bowels of the earth as long as he cares to ; the guide gives the signal below to the engineer above, and he is pulled up 1500 feet in a minute and a half, landing safely on the surface.

He doffs his borrowed flannel suit and after donning his own directs his steps to the hotel and had been seated but a moment at the dinner table, when an alarm of fire was heard, and on going to the door it was found that the building covering the main shaft of the mine, just visited, was all ablaze. The blazing sticks of wood falling down the shaft lodged on the timbers here and there below and very soon the upper portion of the shaft was on fire. The fire-preventive apparatus, described earlier in the pages of this book, was not put up when this building was built ; it was a rough covering and considered not of much account. The miners at work 1500 feet below heard of the fire above, rushed to the shaft and succeeded in getting through the stopes and wings half way up to the surface, when, to their horror, they saw for the first time that the shaft above them was

a-fire, and a further ascent through it impossible. Death stares them in the face; one other mode of escape flashed before them, and at once they made a hasty descent. When reaching the lower level they directed their steps to another shaft two or three thousand feet distant; the fire had not reached it, and they were fortunate enough to make their escape through it. The superintendent of the mine was the last one to leave the lowest level. He gave the signal to the engineer above to hoist the cage. He could not induce the others to enter it. They commenced their ascent through wings and stopes. When the cage with the superintendent aboard had been hoisted about 500 feet the fire reached the electric motor in the building, the engineer left it, which caused the cage with the superintendent to fall at once to the bottom of the shaft. So rapid was the descent it bent the irons around the cage. All the men had fled but one, who was groping his way along, and seeing the fall he ran to relieve him, although endangering his own life. He picked up the insensible man, threw him on his shoulder and crawled upon his hands and knees as best he could to the next level, a distance of 100 feet, and then hurried on the same level to the next shaft and succeeded at last in escaping to the surface.

When the superintendent was conveyed to his boarding-house, he was placed upon his bed. For several weeks he was not able to move, but aided by the best of care he began to recover. It was considered a miracle that he was not killed, and yet *such narrow escapes* had previously occurred.

CHAPTER XVIII.

The superintendent was an enigma to the people of the village. They could not read him; he kept aloof from everybody. He was a recluse. Notwithstanding his diffident manner, he was admired by all and received many attentions during his sickness; it troubled him and he tried to avoid them. On the first day of his recovery he took a short walk at dusk and was surprised to read a poster announcing a meeting at the hall that evening to hear a talk from a young woman upon the "Construction and Operation of Thought," with illustrations. He could not resist the temptation to attend, for he was a thinker; but he could not understand why she came to this small village. He sat in as obscure a seat as possible and listened. He gave marked attention to the discourse. He drank in every word with the eagerness that a hungry man eats the food of which he has been deprived for an unusual length of time. She spoke as follows:

"Is thought the product of the brain? Should the answer be in the affirmative? With the death of the body the end of thought is certain; but let us investigate the phenomena of thought a little further

before we make answer. To the question, Why should thought be so seriously affected when the brain becomes diseased? the reply is often given that if thought were immortal and independent it would not be weakened by any shortcoming of the cranium. Persons become insane through some disease of the organ by which thought makes itself manifest. Generally only a portion of the brain is diseased; and in insanity it operates, in many cases, the same as in frightful dreams, nightmare, etc. Here, we are aware the incongruity, the unreasonableness of thought exhibited is due to the disassociation of ideas. The diseased portion is unhealthy in its action, and, like the loss of a spoke in a wheel, it unbalances the whole, and is of but little use to us. Good, well-developed thought requires the harmonious action of every portion of the brain; and each and every organ must be present and blend with one another, as the white light from the sun requires the presence of every color to perfect it. Our answer, then, must be that thought is not the offspring of the brain, but that the brain is the machine, or instrument, and, in fact, the only instrument through which it is possible for thought to make itself manifest. Could our eyes be made sufficiently microscopic, with a magnifying power far surpassing anything man has ever produced, to examine an active brain exposed to view, it is my belief that thought, in its multitudinous ways, could be seen operating upon the brain, in all its varied portions, as apparently and with as delicate a

8

motion, as does wind upon the reeds of the organ which, through the fingers of a Mozart touching its keys, sends rich tones through cycles of time to the ears of the civilized world. Because a portion of the brain becomes diseased, and the harmonious working of thought is consequently disturbed, it furnishes no evidence that thought, *per se*, is not an independent power behind the brain. Steam, and electricity which sends the iron horse over the network of railways spanning the continent, is invisible, but its power is felt throughout the length and breadth of the land. Is steam or electricity the product of the locomotive, or is the locomotive merely the instrument through which steam or electricity operates? The brain is the servant of thought; and if the former is deficient in size, in shape, in quality and harmony of all its parts, the display of thought will be correspondingly weak. Take the brain of an idiot, observe its shape; the backward slope in the frontal portion indicates a small cerebrum, especially in that locality where the reasoning and intellectual faculties reside. Thought—intellectual thought—is here deprived of an instrument through which it can make itself manifest; and yet this portion of the brain is capable of development. One-half of the idiots who enter institutions for the idiotic between the ages of five and twelve graduate with the cerebrum developed, and an increased intellect sufficient to obtain a livelihood and perform the ordinary duties of life. Does thought lie dormant in the brain of an idiot, awaiting the perfection of an

instrument through which it can unfold itself? A pint bottle cannot contain a quart of water.

“ We have now arrived at that point in our investigations where the composition or construction of thought must be studied. What is thought? The spinal cord and the brain contain registering ganglia on which are impressed sensations of pleasure or injury to the body and conveyed by the sensory tract to the registering ganglion, and stamped thereon. Sensations resulting from the action of thought are impressed or stamped on the grand sensorium in the brain; that thought stamped on these ganglia in early childhood, and recalled and repeated in old age, proves the truth of this long established hypothesis. Granting its correctness, it requires something more than an imaginary, shadowy something to stamp itself upon a ganglion, or any form of matter, and retain the impression for scores of years. We can readily understand how speech impresses and stamps itself on the disc of the telephone, for sound causes a vibration of the air through which it passes, and, on reaching the ear, stamps its impressions on the tympanum or drum. This is accomplished by a force called motion. If thought is a substance, as one writer claims, it must possess a force behind to stamp or impress it on the ganglia, and that is certainly beyond our conception; but that it belongs to the forces is possible. Our thoughts are largely made up of impressions recorded or stamped upon the sensorium. Recall all the thoughts possible emanating from the brain within

the past twenty-four hours, and it will be noticed that most of them occupied our thoughts before, some of them concerning events of the past, or to come. They have been stamped and stored away in the brain for future use, like the ruminants who eat grass or hay and store it in the first stomach unchewed, while at their leisure they bring it out and chew the cud.* These events or occurrences are stamped upon the sensorium in the brain; they are evolved in our mind, and we think of them over and over. Now these impressions which constitute a portion of our thoughts, being stamped upon the sensorium as tangibly and as really as a figure-head is impressed upon a silver coin, must necessarily perish when our body dies; and it is the end of those thoughts which we hold in reserve in the brain, stamped on the sensorium, or the tablet of memory. When death ensues, therefore, they can be no longer recalled; for they belong to the body, and must perish with it, as the form of the head stamped on the coin must pass away when the coin wastes and wears out.

“But it may be said that all of our thoughts are not recalled from the sensorium and given out second-hand, but that a portion are original, new to us, and enter the brain for the first time, and are stamped on the sensory ganglion. Very true, but most of these thoughts original to us are what the eye sees or reads, or the ear hears, and through the nerves of special sensation, which are the nerves of most of the senses, receive the outward sensation, and conduct

them to the sensorium upon which they are stamped. 'There is nothing,' it is said, 'new under the sun;' and yet there arise in the minds of men thoughts which are new and original, and have never before been brought out. If not, what becomes of our boasted advance in civilization, of our progress in the arts and sciences? Where do we find, in the history of the distinct past, the thought that harnessed the electric spark, and drove it around the world? Where the thought that bottled up steam and electricity in iron bands, and sent them flying upon the rails, dragging across a continent coaches filled with human beings? And where the thought that discovered a process by which words wasted upon the air could be caught, and, by their own weight and motion in the passage, be stamped and secured upon a mass of tin, and ages after ground out and repeated in the same tone and the same words of the original, spoken years in the past? These thoughts could not have been previously found upon the sensorium or the ganglia in the brain of any living man, nor could the objects of these discoveries have been impressed on the ganglia, or nerves of special sensation, the instruments serving the eye, ear, etc., for the objects or discoveries had no existence. And here we have barely escaped drifting into the maelstrom of materialism; for we have found that all of thought does not belong to the body, and cannot perish with it, however great a portion may be stamped upon our brain, and apparently die with it as individualized thought. Whether the spirit released from the body possesses

the power to copy it, in any manner, from the dead and perishable sensorium, demands further investigation.

“We have found that, although a large portion of our thoughts are old, and stored away in the grand sensorium, or, more properly speaking impressed thereon, and continually brought out and reimpresed again, yet there are thoughts, previously explained, which are new, and never before known to have entered the brain of man; and they were not impressed upon the brain, as are most thoughts, from external objects which, through the senses, find their way to the sensory ganglia, and are continually reproduced. These new and original thoughts could not have had any previous connection with the brain in any form, and consequently must have sprung from some source outside of our material body; and, although these thoughts and all other thoughts impressed upon the grand sensorium in the brain, and those impressions mechanically stamped on matter, must perish at the death of the body, yet the source from which these thought-impressions were made is as much separated from the body, and must be as imperishable and immortal, as is the light from the North Star. The form of the Dipper in the constellation of the Great Bear in the heavens is impressed upon our retina, and the sensation conveyed to the brain through the optic thalamus; but the source from which the light which was impressed upon the brain emanated is distinct and separate from our body, although the impression made upon the ganglia is materialized, and perishes with the body.

“ The question now arises, Are the thoughts here gained through study and experience continued in a life beyond? I can see no reason why the disembodied spirit should not have the same power to view its own accumulated thoughts stamped and registered on the registering ganglion or grand sensorium of its dead form laid in the tomb as does the embodied spirit in reading the printed record in a book, as long as either form of matter remains entire and undecomposed. And does it not seem probable that the accumulated thoughts gained in this world are continued beyond the decomposition of the body, remaining individualized by being incorporated into our spiritual being, as part and parcel of our individual self, which, as I view it, must be imperishable and, consequently, without end? It is useless for me to speculate in these papers upon the undeniable, unquestionable certainties of the forms of development of thought or spirit in the life beyond, for our consciousness or appreciation of every existing force, or form of thought, is weighed, judged and understood through matter, or our material senses. We may reason and philosophize upon the probabilities of the immortality of thought, but, when we state that to be true and unquestionable which cannot be demonstrated by actual knowledge, we simply expose our ignorance. Spirit cannot have a full conception of spirit while connected with matter, nor can thought of itself, alone and independent from aught else. Philosophers have divided on the question as to the possibility of any one being able to real-

ize his own existence ; that nothing can realize the existence of anything only by standing outside or apart from it, and viewing it as separate and independent.

“ How can thought realize or form a conception of itself any more than spirit can conceive of spirit as independent from matter? We witness the results, the operations, the manifestations of these forces through matter, but as to their composition and form we know nothing, nor ever can, while we are united to matter. We are consequently obliged to judge and weigh all things through matter, as all experience and knowledge upon earth are gained through it, and can be gained through no other source during our stay in the present earthly form. Notwithstanding the absence of any certainty, I am, nevertheless, strong in the belief that we live always, and that thought is ever present, and is part and parcel of our spiritual being through all time. As I look into the firmament and watch, year after year, the movement of the stars, and see with what wonderful accuracy they appear in their accustomed places, crossing the meridian at twelve o'clock at night, each in their turn, throughout the year, and marching on to meet in the same place, and at the same hour, at the close of another year, and thus continue for ages to come, as they have for ages in the past, in the same measured yearly course ; and as I look upon our own planet, and find the same accuracy in revolving around the sun, moving at the rate of 68,000 miles an hour, or forty times faster than a cannon ball shot from a cannon's mouth, and coming to time in each

revolution in just 365 days, 6 hours, 9 minutes and 10.75 seconds, without deviating a second for thousands of revolutions at least; and also upon Jupiter, who performs his revolution in 11 years, 10 months, 17 days, 14 hours, 24 minutes and 25.5 seconds, and Saturn his in 29½ years, each revolution again and again performed with the same accuracy that is known of the earth—such wonderful accuracies, I repeat, point us to the powers that be, and are a sufficient guarantee to me that I am safe, beyond a doubt, in trusting my future to those accurate, ay, infallible powers that so correctly keep all bodies in their true and proper place. In them I am content.

“As well might one climb to the summit of the loftiest mountain on the globe, and leap forty miles into space to find the point where the atmosphere that surrounds our earth begins, as to determine where thought commences in the animal creation. It diminishes so gradually from man to the lower forms of animal life that it is impossible to find its utmost limit; and, notwithstanding that the articulates are apparently as low as we can trace anything worthy the name of thought, yet I do not hesitate to say that it is possible, ay, and quite probable, that every living thing that moves by its own volition possesses thought; for by what other process can it choose its own direction of locomotion?

“Thought is divided into two forms—reason and instinct. Reason is that quality of thought capable of being educated and developed; while instinct is a

fixed, uneducated habit. Man, and, in fact, all the vertebrates, possess both instinct and reason. We see this manifested in self-defence, in parental love, desire for gain, and many other qualities common to most animals. With many men, if not most of them, instinct is as properly manifested as reason. They make no attempt to develop thought, but are satisfied with sufficient to eat and drink, and leave the world no wiser than their fathers preceding them. For this great want of development in thought we all, I think, are responsible. The duty should be impressed upon the mind of every child born into the world to become better, wiser and farther advanced in intellectual thought than its parents; if not, what becomes of progress and the development of the race? The end of most men on earth appears to be satisfactorily attained if they can come out of it whole, and leave the world no worse for their having been born. More thought is the thing wanted in all departments of life, in the mechanic and in the farmer, in the physician and in the preacher, in the capitalist and in the reformer, in the statesman and in the philosopher, in the teacher and in the scholar, in the parent and in the child."

When the speaker concluded, the mine superintendent, with as little noise as possible, immediately left the hall; and the speaker, after a few commendatory words to her by some of the audience, looked eagerly in the direction of the auditor to whom she was attracted by his marked attention to her lecture, and noticing his absence from the hall she at once

BREAKING UP.

depart with the purpose of overtaking him; she hastened her steps, but not being able to find the man, she entered the hotel.

Making the acquaintance of a lady living there, she said :

“ At my lecture this evening I was attracted by the unusual and earnest attention of a gentleman;” and here she described his apparel, his complexion, countenance, size and general appearance.

“ He was also,” she said, “ a little lame and a remarkably intelligent looking man. Do you remember any one answering to this description?”

The stranger answered “ I think I do. Was it not the superintendent of the mine, Mr. Farlo?”

“ And who is he?” asked the lecturer.

“ He came here about a year since and at once engaged to work in the mine. He had not been here long before the proprietors found him possessed of an extensive scientific knowledge and especially of mineralogy; he was invaluable to them and they very soon made him their superintendent. He is, however, a mystery to the people here; keeps aloof from them and lives the life of a recluse. Most of his time is spent in the mine. He has just recovered from a terrible fall there. His lameness, you noticed, is due to that.”

And at the conclusion of these words the lecturer bade the lady good evening and retired to her chamber. Sleep did not come to her that night, she lay thinking of the superintendent.

CHAPTER XIX.

For months had she been searching for him, thinking to lure him from his retreat, by advertising a lecture upon some philosophical or scientific subject which would certainly excite his interest. Town after town she visited and at last had tried the mining town. At eleven o'clock on the following morning a woman obtained permission of one of the proprietors to visit the mine ; the guide accompanied her down the shaft. The miners were at work on a lower level blasting and clearing away the rock and hoisting it to meet an old shaft abandoned half a mile distant. They expected to meet this shaft on the following day, but the last blast had penetrated farther than was anticipated and it was reached, but alas, too soon, for the pent up carbonic acid gas and water therein was let loose and both at once filled a portion of the mine ; the miners were terrified and ran for their lives, the guide and the lecturer with the rest. The swift-footed who reached the main shaft first by ascending to the next level pulled the signal and the cage was hoisted ; as soon as they landed the engineer was instructed to lower the cage and bring up the remainder ; he did so, but to

his horror no signal was made. The superintendent not feeling able to enter the mine that day was informed at home of the disaster, and consulted what was best to do. He was told that the lecturer of the previous evening had visited the mine, and was one of the unfortunates left.

"I will be there at once," he said, and the messenger departed. A thousand thoughts entered the superintendent's brain as he was making ready.

He had recognized the lecturer the moment he entered the hall the previous evening as one of his near friends from home, but as he sat in an obscure corner and his appearance had so changed, he felt he would not be noticed. What shall I do, he thought, risk being detected by attempting to save her life? Yes, I will go, and in a moment he departed and soon reached the mine.

Again and again did they attempt to get a signal from below, but to their efforts no response came. At last the superintendent determined to go down, but those around the shaft begged him not to attempt it, for death would certainly result; but he gave orders to the engineer and the cage was lowered. A half an hour passed and the people of the town hearing of the calamity flocked around the shaft; some of them were mothers waiting in anguish for the appearance from below of their unfortunate sons, others were wives wailing for the loss of their poor husbands. At last the signal was heard, the iron car was hoisted; but alas, as it arose to the surface the body of the superintendent was seen

prostrate and unconscious. Restoratives were applied and in a few hours he revived. His first words were, as his eyes opened :

“ Has she been found ? ”

“ No,” was the answer, “ nothing has been heard from below since you came up.”

He attempted to rise but fell back in a swoon again.

Twenty-four hours had passed and no signal from below. The moaning and the wailing from friends in the crowd above who had been waiting in anguish all day and night was hard to bear. Thirty-five hours had now passed. All hope was lost and the caskets and shrouds for the dead below were deposited about the shaft ; they waited for the floods and gas to subside, when search for the bodies would be made.

“ What is that ? ” shouted the crowd, and again a signal from below was heard.

“ Life ! life ! ” all shouted and the car was lowered. The superintendent started at the ring and reached the shaft, awaiting anxiously with the rest the return of the car ; another signal and it arose, it reached the surface and a grand hurrah was given as two of the poor, weak victims alighted.

“ But where is the woman ? ” the superintendent feelingly cried.

“ She was still living,” the two miners answered, “ when we left, but she was out of our reach and we were too weak to struggle for her. All the rest have perished.”

In an instant the superintendent gave command to lower the cage. Nothing could stop him and he jumped upon it as it dropped. Down, down he went; as he neared the bottom, both to the right and the left he looked, and as he descended to within about fifteen feet of the next level he espied a form clinging to a rock, a niche in the shaft, the water had risen up to her waist; he gave the signal above to stop the cage, he reached out and with a mighty effort he snatched her from her perilous foothold, and landed her on the car. She gasped, looked up at her deliverer and whispered:

“It is Lodo! Oh, that I may live to be near and protect you.”

Lodo (who is none other than the superintendent) spoke: “You shall live, Selucea,” and the signal was given to raise the car. When it reached the surface—“Thank God,” the crowd echoed, and Selucea fell fainting in the arms of Lodo. She was at once conveyed to her room in the hotel and Lodo accompanied her. She revived when laid on her bed and Lodo at once obtained a nurse, and then made haste to return to the mine. In a few hours the gas in the mine passed off, the flood subsided and the bodies of the dead miners, eleven in all, were found and brought above to be cared for by their sorrow-stricken friends.

CHAPTER XX.

The tender interest and care Lodo paid to Selucea in the sickness following the accident did not excite much comment about town, for he had saved her life and it was no more than might be expected from a brave man, and then again her continued calls for him were thought to be due to gratitude to her deliverer. On the evening of Selucea's lecture when Lodo became so enchanted with the masterly handling of the difficult subject with which she had to deal he admired and adored her, but dare not remain fearing detection and betrayal. As soon as she gained in strength Lodo said :

“How came you so familiar with the philosophical subjects you spoke upon the other evening at the hall?” to which Selucea replied :

“Lodo, I loved you, and noticed when you were at home that the great learning of Trienna gained your esteem and perhaps your affection. It was just and proper and I soon came to view it so. I resolved at once to study, and leaving home I worked in earnest. After studying a twelve month, the faculty were astounded at my progress. I plunged into science and philosophy, and graduated the day

you fled from home. Hearing from Leonia the story of the injustice done you, I resolved to search and when found to watch and protect you. To accomplish this I felt impelled to lecture from place to place on philosophical subjects, which to my mind would attract your attention and draw you from your retreat."

"Selucea," said Lodo, "you are a martyr. I respect your learning, I admire your courage; your acts exhibit unbounded trust in me; your friendship is true and loyal, and your love, my dear Selucea, is reciprocated."

When these words were spoken she sprang from her couch on which she was half reclining and throwing her arms around his neck, she murmured:

"Is this a dream, did you say you loved me, say it again, Lodo?"

"I love you," he answered, "with all my heart and soul," and she wept with joy.

CHAPTER XXI.

Another meeting at the Academy attracted a large audience. Mulane, an eminent man in the nation, arose and spoke upon the treatment of criminals.

“What can you and I do to lessen crime? What can be done to make it safer for you and me to live here in peace and happiness upon this planet? What can you and I do to make not only ourselves, but every man and woman better? These are the questions in this era, and are questions which concern you and me more than all others combined. Look at our school-houses dotting here and there every village throughout the land, schools free to every boy and girl from whatsoever race or clime. Look where you will, on the hilltop or in the valley, where men and women are gathered together, whether in the rolling sands of the great desert, along the river courses, or on the shores of the sea, there, pointing heavenward is the church, the milestone, telling of the march of civilization.

“In ancient times the mills of the gods ground fast and *not* exceeding sure; the defalcations and flights abroad illustrate my meaning. They were in a hurry to catch the rogue, get him behind the bars

and for the first bad behavior put his head under the nozzle of a pump. They kept him cheap, worked him for all he was worth, run him through his sentence and set him adrift out among the people, worse for his experience. This was all wrong. We do not send our criminals to prison now to punish them. We can wait and be patient as any good mother will over an unruly child. A true mother will use her best endeavors to reform a bad boy or girl, she will try to fill his very soul with yearnings for a better life, but the government of the ancients, both state, national and local, did not have that aim; punishment was the law and custom, not reformation. We imprison to reform, while they imprisoned to punish and that's just the difference between the decrease and increase of crime. Take as an illustration a man who was arrested for robbery; he was tried, convicted and sentenced to hard labor for a term of five years. He rose in his cell in the morning, ate his three meals, worked or sat in his cell all day planning his escape or how he could best rob another when released and not get caught again; his name was blotted, he was a jail bird and goodness or righteousness had no charms for him, and not only did he continue in vice but he made it tenfold greater by drawing into his caldron a dozen more inexperienced mates. What an influence did that man bring to bear upon a small army of associates! It made the increase of crime tenfold greater by the unconverted character of that one relic of the prison, where, if the right influence had been brought to bear

upon the prisoner behind the bars and a purified soul given to the world, instead of an increase of crime there would have been a decrease in the same ratio. The best treatment for bad criminals, not only for their highest good but for our own, is to colonize them. Our method in America in sending them to Alaska under guard is the best, and those who are weakly to our southern clime. There they are kept in safety under watch and also are governed with a view of reformation instead of punishment. Missionaries appointed by the government spend their lives among them, and when their sentence is served they are allowed to return home, in most cases better men and women.

“ Their work in the penal colony is not severe and every convict is rewarded in money for all that he earns over the cost of his board and clothes, so when at the close of his sentence, instead of leaving the colony penniless and without friends, he or she has a balance to start in life again. The convicts are conveyed to the place of banishment and at the close thereof returned home by the aerial or electric cars at the expense of the government. If their record while banished is good, we do not hesitate to receive them back in society. Banishment is for great crimes, lighter offences are taken care of at home, but always with the view to reform the offender, to make better men and women.

“ History informs us that ever since women became voters and have had an equal share in making laws and executing them, crime has lessened ; at any rate

no one in this epoch, whose mind is well balanced, would for a moment consider a proposition to return to the ancient custom of depriving women of equal rights before the law. And since their advent in taking an equal part in the administration of the government, standing armies became a thing of the past. All men are enrolled and peace is the motto of all nations. In ancient times the people generally were governed by a King and Queen, Emperor or Empress, and tribes by chiefs; now every nation is under a republican form of government, arbitration settles all difficulties and disputes between nations and between nearly all individuals; trials and courts exist for penalties to criminals."

CHAPTER XXII.

In the mine Lodo had commenced to sink the shaft another hundred feet and strike out levels; the vein of ore they had been working terminated rather suddenly and the hanging and lower walls had met. While the miners were at work, under the direction of Lodo, he stepped out into the level and investigated farther the terminus of the vein. While there, at some distance from the shaft, he noticed a stranger with the guide alighting from the car just lowered. He looked again and was startled as he recognized one of his former townsmen from home, a detective. He saw no chance of escape. The detective's eye fell upon him, he was recognized, and approaching him, bade the guide to follow. Lodo ran, he was soon out of his sight, the detective knew not which path to take, he hesitated and then cried aloud for Lodo to surrender as it would go easier with him, but no reply came. Then the detective returned for the guide and commanded him to lead the way and assist in finding Lodo, but the guide put him off the trail and Lodo in the mean time climbed up through the winze and the chute and made his way up to the next level where he gained the shaft. He at once

signalled the engineer above to hoist and he soon reached the surface. He hurried home and packing up a few things he determined to leave town. As he was taking his departure he was met by one of his men, who informed him that the gearing attached to the car in the shaft on its upward flight broke as it neared the surface and four miners with a stranger on board dropped with the car to the bottom of the mine, a depth of 1600 feet, and five tons of chain on top of them.

"Did I understand," said Lodo, "you to say that the stranger was on board?"

"That was what I said, his voice was recognized as he neared the surface."

"Poor fellow," said Lodo, "the fall was so rapid and so far, his breath left him long before he reached the bottom, he is dead and so are all the rest on board, I must go to them at once."

A few minutes more and he was seen at the opening of the shaft, the gearing and chain was at once repaired and another car attached and he gave orders to be lowered with one or two other volunteers to the lowest level. After an hour or two the signal to hoist was heard. The car was drawn up and the mangled bodies of all were discovered on the bottom of the car, enwrapped separately in large blankets. Some were drawn up without arms and feet and others headless, but none of them were found with their boots on, and singularly enough in such accidents they never are. The car was again lowered and Lodo and his men were hoisted up.

The bodies were washed in the great water tanks, they were laid out, placed in the care of their friends. The body of the stranger, who was the detective, Lodo carefully placed in a casket and forwarded it at once to his home and instructed the town authorities to send to the detective's friends an account of the accident. After Lodo's narrow escape from arrest he deemed it best to flee to some other quiet retreat. He hesitated however, as Selucea soon after her recovery returned home, with the promise that she would hasten back and, having not arrived, he knew not where to turn, for should his message to her be intercepted, his whereabouts would be discovered. There was only one alternative and he departed, trusting that in some way she would find him.

A day only after his departure Selucea arrived and was sorely troubled in not being able to find him. She determined to take the lecturing field again and travel from place to place, and in that way perhaps he would learn from posters her presence. She visited several mining towns and at Salome mining camp she was successful in her search. Lodo was not only surprised but filled with joy to meet her. It was not long however before their retreat was found, for at Selucea's home the people entertained a slight suspicion that she might possibly know of his hiding-place and her movements were closely watched by a detective. She was followed from place to place and when Lodo was walking alone at dusk from the mine over the foot hills to his boarding place he was discovered.

On these hills are several old shafts where prospectors were prospecting for gold, and shafts were sunk from 50 to 75 feet, but finding no good ore they were abandoned and left open and exposed.

Lodo recognized the detective, and ran with all possible speed, the detective followed and gained upon him. Lodo quickened his steps but he soon found he was losing ground, his fall in the mine left his limbs a little stiff; he saw that his capture would be an easy one, firearms were not used by officers in this epoch, but the lasso was thrown and police officers and detectives must be experts in throwing it before receiving an appointment. When the fugitive discovers the detective making preparations to throw the lasso he knows there can be no escape, for they never throw it until they are sure of their victim and when the coast is clear they never fail to throw it. Lodo, in his flight, caught sight of the detective preparing his lasso and in an instant he changed his course for a shorter cut over the hills; the light of day was fast disappearing, that was to Lodo's advantage, he knew the ground he was travelling but the detective did not; the latter lost a little in this change, but he soon recovered and gained upon his fugitive, he was now within range of the lasso's reach and the detective threw it. Lodo detected the movement, he gave one cry and dodged, but in vain, it passed over his arms and chest and he was caught, his arms bound; he cast his eyes about him, when lo and behold the detective was tumbling into one of the abandoned shafts. A multitude of

thoughts came to him in a moment, he was held by one end of the lasso and the detective was at the other end. The terrible thought of his being dragged down to death in the shaft with the detective aroused all the latent strength within him; he arrested his backward steps and struggled for life; though his arms were bound he with great difficulty succeeded in getting his knife and was about to cut the rope when the thought instantly flashed upon him that the cutting of it would cause the terrible and instant death of his antagonist in the fall, but then he would escape; and yet he was not behind the age in which he lived in displaying heroic courage in saving the lives of his fellows, though it should result in the sacrifice of his own. He shut his knife and replaced it. The yelling of the detective hanging in the shaft for help was painful to hear and Lodo with herculean strength could just barely arrest the immense strain in being dragged to and down the shaft, but another momentary thought influenced him to fall back slowly and allow the detective to drop inch by inch, for this particular shaft was but about fifty feet deep and the lasso he thought was the same in length. He could not raise him alone, but judged after the man touched the bottom he could remain there until help was obtained. He reached the shaft, the strain having ceased, the detective stood on the bottom. The latter realized his own escape from a horrible death and knew that it was due to Lodo's humanity and thoughtfulness. Magnanimity was the one prevalent characteristic of the age. As soon as

BREAKING UP.

he reached the bottom of the shaft, the detective cried out to Lodo :

“ You are a hero, you could have cut the rope and escaped, but at the cost of my life. If I get out of this alive I will not arrest you, nor be the means of causing your arrest.”

Said Lodo, “ Remain there a few moments and I will obtain help and effect your release,” and Lodo after slipping from his body the lasso and fastening it to a stump near by departed. He did not care to alarm the community and thought by the aid of Selucea and a heavier rope they alone could succeed in hoisting the detective to the surface. He obtained the rope and called Selucea to his aid.

But said Selucea as they were returning to the shaft; “ Are you quite sure that he will keep his word and will not arrest you ? ”

“ Certainly,” he replied, “ no officer of the government would dare to forfeit his word, as he would be dismissed from service, his word is law, no matter the motive which prompted him to give it.”

On arriving at the shaft they immediately went to work and in a few minutes landed the detective safely at the surface. He stood to his agreement and after a few words with Lodo he took passage for home. Lodo felt secure in his retreat and the following day entered the mine again.

CHAPTER XXIII.

When the detective arrived home he kept quiet about the matter, but his evasive answers to questions put to him aroused suspicions in the minds of the authorities that he had seen Lodo, and by questioning the managers of the travelled lines who were familiar with the detective's personal appearance they found where he had been and a detective was sent at once in pursuit. Lodo was at work in a pocket mine, where gold and silver ore were found in spots ; short veins called pockets. The shafts here were inclined to an angle of 67 degrees and not perpendicular as in most extensive mines. Sometimes a giraffe, a small cart, was lowered into the sloping shaft, and run on an iron track, but this was used mostly to draw up the ore and the miners generally walked down and up. Lodo was engaged in directing the men in blasting a rock in anticipation of finding some pocket ore, and was startled in the midst of his labors in discovering two strangers walking down the shaft and advancing toward him ; he at once took in the situation, as one of the strangers he was convinced was a detective, he fled through the level and the strangers followed. He soon got out of their

sight by climbing up stopes and winzes, but as one of the strangers was accustomed to mines they soon were on his track again.

He heard them close behind; he gained a very shallow level, so shallow that he was obliged to crawl upon his hands and knees for hundreds of feet. They lost sight of him here and at last Lodo gained the entrance to the shaft and soon reached the surface. As he was about leaving the opening, he was seized by a watchman placed there by the detective and held until the latter reached the surface. The detective took charge of him and he was conducted to the station. Selucea discovered his arrest and followed. They took an aerial car and departed. The flight of the car was rapid, moving at the rate of over two hundred miles an hour. The electric engine was working to its full power. As they reached the lake over which they were obliged to pass to gain their destination, the electric force became too great and the car caught fire. They were then 500 feet in mid-air with 100 passengers on board, and as soon as the fire was discovered the captain ordered the car to be lowered by reducing the buoyancy of the car and reducing the flapping force of the wing sails. It dropped slowly into the lake and as all aerial cars are built to float, it landed safely; pumps were immediately worked to extinguish the fire and though usually successful in similar cases, the car continued to burn and fill rapidly. Light life-boats made of paper and always attached to cars in flight over any large body of water were at once lowered and a

great rush was made for them ; a few passengers failed to reach them and Lodo, Selucea and the detective were among the unlucky ones. The detective's eagerness to retain Lodo made it difficult for him to escape. Lodo urged Selucea to get into the life-boats, but she would not leave him. Before the car was about to sink Lodo took two chairs and calmly asked Selucea to take one and follow him ; they jumped and the detective with another chair followed. Lodo was an expert swimmer ; Selucea obeyed his instructions and clung to the chair which kept them afloat ; they saw boats near the shore and were in hopes they would come to their rescue ; they had floated some distance from the sinking car and the detective now struggling in the watery deep to save his own life was unable to keep near them. Night was approaching and they were drifting farther from shore ; boats were nearing the sinking car and rescuing everybody in view. Lodo and Selucea saw they were not discovered as the boats returned to the shore but Lodo by treading water succeeded in keeping Selucea and himself afloat ; darkness had now nearly settled upon them, Lodo could just see the detective struggling. Selucea, seeing that the waves were drifting them farther and farther from the shore in spite of Lodo's efforts, and farther into the darkness of the night, began to lose hope, she shrieked and shrieked again, she was heard and that saved their lives, for a boat in search soon appeared at their side and rescued them.

Lodo was the more exhausted of the two, he could

but just whisper as he lay in the bottom of the boat. He beckoned to one of the sailors and with difficulty murmured: "Save that man struggling yonder, look for him." They raised his head, he pointed towards the detective and they with much difficulty saw him and went to his rescue. They pulled him aboard but little life remained. Lodo exhausted fell back in a dead faint and continued so for hours after landing. He was placed in a shore house and Selucea attended him. The detective was carried to another house and partially restored and then conveyed to his own home for further treatment. Selucea by untiring care restored Lodo, and then he announced to her his purpose of delivering himself to the authorities, trusting in God and the people for a righteous judgment. Selucea begged him not to do that, for she feared the truth would not triumph. He visited his mother and sister and then delivered himself to the officers of the law. He was urged to confess the crime. "No," said he, "never, I am innocent."

CHAPTER XXIV.

The day of the trial came. The evidence was against him. "Of course," said the counsel for the government, "he had a motive for killing D'Carlo. D'Carlo dead, Lodo becomes possessed of a snug little fortune. D'Carlo living, he must work the same as the rest of us and then he was detected throwing D'Carlo over the bridge by no less than three parties and what stronger evidence of his guilt can you expect."

He was at once convicted and sentenced to banishment to the penal colony on the Galapagos isles for life unless it should prove that by excellent conduct during banishment he should deserve a shortening of the sentence. Selucea who was present during the trial when the sentence was announced burst into tears and moaned. Falling upon her knees she cried, "Oh God, have mercy upon this court, for they know not what they do."

Lodo was calm and collected and yet manifested bitter disappointment. He was conveyed to and confined in the State building for convicts, there to remain until a party was made up to be conveyed to the penal colony. Selucea in the mean time fre-

quented the guarded room in which he was confined. His mother and sister Laonia were also frequent visitors. Selucea by her kind and thoughtful attentions to Lodo commanded the sympathy of the keeper and the watchman by whom she daily passed to reach him. After quite a number of her daily visits she became so familiar with the watchman and keeper she dropped a bit of sweetmeat in their hands to eat as she passed. She had determined to leave no stone unturned in the attempt to effect the escape of Lodo from a life banishment to a distant clime, and her efforts were to that end. A few hours more only remained, she dropped her usual bit of sweetmeat in the hands of the watchman and the keeper. She watched the effect upon them, they were soon asleep, and she rushed for Lodo's room and hastily said :

“Lodo, the watch is asleep, follow me and your escape from this injustice is certain. Without, I have an aerial car waiting to conduct us to a distant clime of our own choice, come at once.”

“No,” said Lodo, “that would not be right Selucea, I cannot accept your release. Reflect a moment, I believe in the laws of my country, notwithstanding I am innocent of the crime for which I stand accused and convicted. I was tried in accordance with the laws of the land and convicted, and if I escape I am resisting those laws which I helped to enact and wherefore should I be made an exception?”

“But,” said Selucea, “you fled from home to escape arrest.”

"I did," answered Lodo, "but not to escape justice. I thought my absence for a while would cause the excitement to subside and prejudice to some extent disappear. I always intended to return and report myself to the authorities at the proper time and I did, but alas! I am bitterly disappointed in the result. I still think God and the people believe in justice and that I shall yet get my measure, so Selucea let us hope and pray."

"Grant me one more favor, Lodo," said Selucea. "Let me follow you in your banishment. Do not deny me, I must be with you, to cheer, encourage and protect you."

Lodo answered: "Do you think of the hardships you must suffer and endure there?"

"I do," said Selucea. "Rather would I be near you though in banishment than remain here surrounded with all the luxuries that could be heaped upon me."

"Then," answered Lodo, "I cannot say nay, do as you will," and she departed. The guards awoke.

A few hours and a company of convicts were gathered, Lodo among the rest, to make ready for their long journey. The mother of Lodo and Laonia came to bid him good-by. Their grief to see their innocent son and brother torn from them to pass the remainder of his life in a penal colony was heart-rending. Selucea was on hand and prepared to follow him in another car. All was ready, the command was given to start. Lodo's mother and sister were holding Lodo in their fond embrace. An officer stepped forward tenderly to separate

them, when lo, as the signal to start was beginning to be sounded, a shout rent the air; something in the distance attracted the officer's attention, they hesitated, the object drew nearer. Two occupants in an aerial car were approaching. "Hold! hold!" they shouted. The car reached them, two men alighted, and one of them fell in a swoon upon the ground. The other who was a leading officer of the town spoke as follows:

"D'Carlo lives, and Lodo, I am delighted to say, is innocent of the crime for which he was unjustly accused. Here is D'Carlo, lying unconscious, and at your feet, forgive him, he is dying."

Lodo instantly sprang to the side of D'Carlo. He lifted him up a little and endeavored to revive him.

D'Carlo opened his eyes and they fell upon Lodo as he lay in his arms. He attempts to speak and all was hushed.

"It was jealousy," he faintly murmured, "you didn't throw me off the bridge. In my struggle to throw you off I lost my balance and dropped. I was picked up by a passing vessel, where I watched your unsuccessful attempt to rescue me. My life is nearly spent, I heard of your arrest, and have exhausted my strength in my haste to reach you and prove your innocence, for—forgive me, Lodo, 'twas jealousy—jealousy—jealousy," and in another moment he fell back and breathed his last.

"Revive again," cried Lodo, "I forgive you, D'Carlo, speak!—alas! he is on his journey to that land beyond the river, he is gone, it is his last, poor fellow, adieu."

CHAPTER XXV.

As D'Carlo died before he was thirty-five years of age, Lodo inherited the fortune left by his uncle, mentioned in the will. Lodo became again happily situated at home with his mother and sister. He also renewed his studies and investigations in philosophy and science where he left them at the time of his departure. He is the one above all others whom the community in which he dwells like to speak about. They talk of the cruelty and injustice heaped upon him, he is the hero of the hour. Selucea is doubly welcomed at his home. The time has been fixed for her union in marriage with Lodo. The day has arrived and the hour is kept sacred by the entire community. Everybody is interested in the event. He is their patron saint. And she upon whom his choice falls upon to wed, receives equal adoration. The ringing of marriage bells is in the air, they are united, not by the minister of a flock, but by the whole community. The male portion standing as his best man and the women as the bridesmaids, while the chairman completes the legal compact.



THIRD BOOK
✦ 75th EPOCH ✦
BREAKING UP.





CHAPTER I.

The earth has now reached the seventy-fifth epoch of its existence. It has passed the prime of life, it is in its dotage. Three-quarters of its history is recorded upon the scroll of time. Life upon its surface is drawing to a close, the same as upon other riper planets, and this is largely due to the diminishing quantity of heat. The sun from whence is derived the principal portion of our heat has spent the larger part of its caloric force, and is now preparing for the introduction of life upon its own immense surface. And here it will be necessary to describe the condition and composition of the sun, that the reader may become familiar with the philosophy of its development and the influence this development bears on the continuance of life upon our planet.

Perhaps the most popular hypothesis among scientists to-day is that advanced by Sir William Herschel, who was of the opinion that the nucleus of the sun was opaque, dark and solid, that it was surrounded by an incandescent, gaseous envelope, or fiery clouds, no denser than the Aurora Borealis or the electrical light at the North and South polar regions of our

planet, and that the spots seen moving upon the sun's surface are simply openings in this cloud or gas envelope, due to violent disturbances which reveal to us the sun's dark nucleus. These luminous clouds are called the Photosphere; but outside of the Photosphere there is another cloud envelope called the Chromosphere. Prof. C. A. Young of Princeton College has advanced the most consistent ideas of its constitution. The density of the sun according to his investigations is very light, many times less than that of the earth, and consequently from the disturbance of its surface as exhibited in the solar spots, its mass must consist of gas, for the prominences so often observed on its edge, are undoubtedly due to frequent explosions, extending several hundred thousand miles from the sun, and moving like clouds with an immense velocity around its surface. These explosions also suggest the hypothesis that the surface consists of a liquid crust, which is disturbed by the pent up gases below; this envelope may be a continuous shower of rain, not of water, but the sun's molten mass, whose condensations and combinations are supposed to furnish the solar heat. The sun is some 1,400,000 times larger than the earth in volume and its distance from us is about 92,500,000 miles. To comprehend this distance some one has made an apt illustration by the introduction of a baby with an arm long enough to reach the hot fiery sun. Should the babe put its little finger thereon and burn it to a crisp he would not feel the pain (providing the sensation from the

injured portion to the sensorium of the brain travelled as rapidly as in our body which is about 200 feet per second) until he reached the advanced age of 130 years.

The heat that the sun is expending into space is immense; the earth receives but a small fraction as the solar mass is sending it out in all directions from its surface and accordingly our planet can absorb only those heat rays in its own direction from the sun, and as the earth is distant from the solar mass 92,500,000 miles a large portion is lost or spent in space ere the rays reach or strike our globe.

The nearer any matter on the earth is placed to the burning mass, or source of heat, the more intense are the heat rays received; the more distant the object therefrom, the less the heat. The amount of heat received by our planet from the sun from observations made by Sir John Herschel is sufficient to melt yearly a crust of ice 102 feet in thickness. The entire amount of heat expended by the sun in all directions is estimated at 12,650,000,000 of cubic miles a minute. If the solar mass possesses the same capacity for retaining heat as water (which is very great) the loss in its escape for one year would cool or lower the temperature of its whole mass about one and eight-tenths degrees C. and for 5000 years the loss of heat would cool the sun 9000 degrees C. In 250 million of years (the estimate given by some geologists as the age of our planet) the heat lost by the solar mass in the same ratio, would amount to some 450,000,000 degrees C.

We can easily perceive that in the course of time the sun will have spent all its surplus heat, and life become possible upon its surface. It will pass through the same process of development as our own planet. Long before this condition of things has been reached, life upon our globe must necessarily become extinct, from the absence of heat to support it. If also the old hypothesis is true, that the interior of the earth is a fiery, molten mass and has been gradually cooling, the crust growing thicker from time to time and that a portion of the heat received on the surface is derived from below, the time will have passed before the seventy-fifth epoch is reached, ere the earth will have spent all its internal heat and become a solid. To be sure it is possible that cosmical masses (meteorites, comets, etc.) are falling daily into the sun, and replenishing by concussion the heat continually spent, but when these masses in the solar system become absorbed by the sun (as they will be) the amount of heat from this source will cease.

CHAPTER 11.

In Africa on the banks of Albert Nyanza, right under the equator and in the seventy-fifth epoch of the earth's existence, is a town bearing the name of Caánza. The inhabitants are not of the same color as those living here in the thirty-fifth epoch, the intense heat of the tropical sun gave them their black skin, but the conditions have now changed on the earth's surface, and now is seen a pale, white complexion; and what is true of this town is true of all Africa, and of all climes where man now dwells. Let us enter one of the dwellings in Caánza. A family consisting of a mother, a father and two children. The father lies motionless upon the bed. The family are filled with grief, for the husband and father is dying. A physician is at his side. "The patient," he says, "breathes his last," and the wife and children are told that he is no more. "This cold climate," the physician says, "is too much for him, and yet, though under the equator, there is none warmer on the earth." On the following day the remains are put into a casket, friends and neighbors assemble, the casket is being closed, as the widow and children are giving it their last look; lo!

the widow screams, "He lives ! he moves ! his eyes open !" she stoops and kisses him. The assembled are dumb and know not what to say. At last they remove him from his casket and place him upon the bed. The physician is called and cannot account for the sudden revival. He left him dead and he is alive again.

CHAPTER III.

In this epoch, there are no inhabitants or any living thing in the Arctic or Temperate zones, either north or south of the equator.

The belt around the earth under the equator, and known as the Torrid zone, is inhabited and that is the only place where life can now be supported, simply because it is the only region where sufficient heat is found ; all other localities upon the globe are frozen and solidified, both water and land. The sun's vertical rays in the Torrid zone are just sufficient to barely support life, both in the animal and vegetable kingdom. It is a hard struggle for the inhabitants. A struggle to obtain sufficient food and fuel, for it is cold as in Greenland during the thirty-fifth epoch. The dwellings are peculiarly constructed. They are built mostly of glass, just enough wood or iron to hold the glass in place, except the ground floor which is of wood. This is done to obtain all the sun's rays possible. They are not built like the hot-house of the thirty-fifth epoch, for the glass of that era, in the North Temperate zone, was inclined to the south to catch the rays, but in the Torrid zone it is changed, and the sun's

rays are more nearly vertical, so that the buildings in this era are never more than one story in order that each room may receive all the rays that strike the glass roof. The glass of which the houses are built is from one-half inch to an inch thick and clear, as some chemical was discovered ages ago to put into the melted mass that absorbs, attracts and clears it of all impurities. The roofs of the dwellings are but slightly pitched, one half inclines to the north and the other half to the south, and both ends very slightly inclined.

No vegetables, cereals or fruits are raised out of doors, everything is grown under glass. A glass house for these purposes often covers acres, yet generally each family build only enough to cover a small garden. Tropical fruits, such as formerly grown, bananas, oranges, dates, figs and grapes, are no longer known, except as very rare plants. Dress consists largely of sealskin and of such other material as was worn by the Esquimaux in the thirty-fifth epoch; also their food is largely the same as was eaten by them, except that no bears exist in this epoch from which to make clothing and no meat from this source, for food, and one other difference also is seen in the living of the inhabitants of this epoch, and that of the Esquimaux. In this era as described above, the march of civilization has enabled them to raise under glass vegetables, fruits and cereals which the Esquimaux did not enjoy and then the improvement of their dwellings as described are like palaces, crystal palaces, in comparison to

their huts in an equally cold climate. Seals, amphibians and fish are the only animal food that they get to eat, as no other animals now exist upon the face of the earth. Those animals that were not destroyed by the advancing frigidity of the earth were exterminated by man to make room and food for him in the narrow belt of the tropics. Though the diminution of heat has deprived him of many of the comforts of life, civilization has held its own and here, right in the heart of Africa, it reached the high-water mark, for nowhere upon the earth had education reached a higher plane, and moral culture more generally prized and practised than here, but it must be said that the Caucasian element permeated the whole continent; they ruled and governed and were the head and front of all enterprises.

CHAPTER IV.

Said Honore to Strepe, "I think, my son, you should take a trip around the world, and I wish you especially to visit places on the outer limits of our zone."

Strepe was pleased with the idea and in a short time made ready and took the first aerial car that made the circuit. The trip could have been made in six days but he desired to stop to visit places of interest.

Strepe departed and in due time returned and thanked his parents for the opportunity afforded him of seeing the world or rather what there was left of its inhabited portion. Said he, "I first visited what was known in ancient times as the Great Sahara Desert, but now nothing is seen to indicate this once vast barren waste. Ages ago it was found necessary in order to utilize this sandy tract to bore artesian wells and instead of only one oasis in the desert there soon flourished many. Everywhere an artesian well was put into operation. The soil was watered, seed sown and planted, grasses, fruits and vegetables became abundant, and in the course of time the desert was one vast prairie covered with verdure.

It became nature's great storehouse of food for all the region about. Cities sprang up, commercial centres flourished throughout the once barren desert, but alas ! how changed ; to-day the northern portion has returned to its primitive waste again, grasses, trees, vines and all vegetation are gone ; but in the southern portion, so much as is embraced in the Torrid zone, still supports vegetation. Our course after leaving the Sahara was westward across the Atlantic, reaching the West Indies, where we found the tropical fruits of that region could not be grown with any certainty unless under glass. From here we crossed over to Florida, one of the most southerly States of that ancient republic, the greatest in the world's history, the United States of America. Here oranges and tropical fruits flourished in all their luxuriance ages past, but now there is nothing to indicate its history, all is a barren and frozen waste. No alligators and other monstrosities to disturb the sleep of the dead, for the ocean which once bathed its shores and the great gulf which warmed the coast is now a frozen mass of ice, open at places but sufficiently frozen to obstruct all navigation around and about it.

“ We next visited the mouth of that mighty river, the Mississippi, that once floated the commerce of a mighty nation, and what a surprise to those departed souls once living there could they revisit the earth and view the river of ice that now fills the space, with no vessel afloat or cities dotting its banks or habitation of any description or trees or grasses to vary

the scene. Our next place to view was Central America. Vegetation here was more luxuriant than in the West Indies. The history of this country has been repeated more than any with which I am acquainted. Before the advent of the white race on the western hemisphere it was peopled by an advanced type of civilized men, and in the course of time they became extinct, leaving traces of their flourishing existence. After a sleep of ages civilization took a start. The United States of America had then reached the high-water-mark of its attainments, and was tottering down the declivity of time, when Central America was crowding towards the front and became a powerful nation for one of its limited area. She has lost some of her vigor and strength but is still active and enterprising and is one of the commercial centres. We next visited the once famous city of Mexico. It has passed through two prosperous eras, but is now fast declining. Its buildings are being forsaken, slowly but surely. The climate is too cold for the people's comfort. A few centuries more and its history will be completed.

“After viewing this portion of the country we directed our course southward or rather southeasterly and alighted at the mouth of the Amazon and then followed its course. Here right under the equator it was delightful, not of course as tropical, nor the banks covered with fruit as of yore, but it was more like home, on the banks of the Albert Nyanza, than where no place upon the face of the

earth is more luxuriant in this epoch. The waters were not frozen, the river was alive with vessels, and fish caught here furnished a good diet for the inhabitants. We journeyed farther south into Brazil and passed over the once celebrated city of Rio Janeiro, nothing remains except a few ancient ruins built of stone to mark the spot. We passed on and over the spot which was once the site of the city of Valparaiso. Not even a ruin remains; the place is known, however, by some natural geological formations which indicate the spot. We then journeyed northward again, and pass over that ancient country of Peru. It's a beautiful country. Vegetation is of a healthy color and growth. We journeyed farther northward, crossed Panama, and here ages ago the two oceans were connected by an immense canal, where a half dozen vessels of large tonnage could pass along side through it. We now cross the Pacific and pass over the East Indies, and here nature has been as generous with its people as anywhere, for ages and ages vegetation in all its variety has flourished here, in its natural state. There has been a change, however, even here, for what once grew out of doors, is now grown under glass, but what is produced is vigorous and thrifty. We next passed northward and touched China. The most southern portion of this country is inhabited, yet sparsely, but the middle and northern portion became ages ago depopulated, as did Japan. Next came Farther India or Siam, there nature is more lavish; as vegetation under glass is vigorous and crops are good, the Chinese and

Malays of old have bleached out and are as white as the Caucasians, with whom they are more or less mixed. We then passed southerly over Australia, the extreme northerly portion only is inhabited. We then proceeded northerly and touched upon India or Hindoostan. The southerly portion has a fair population and Madras is a commercial centre. The Caucasian race are the sole occupants here. We made a flying visit to Egypt and Palestine but nothing remained to mark the spot of these very ancient countries, except the mountains and the icy rivers within their borders; and this, mother, closes the history of my journey."

CHAPTER V.

Africa, although not *the* centre of civilization, is *one* of the centres. Nowhere on the face of the globe did intelligence take a longer step in the progress of the age than here. We see no longer the African as he was seen in the thirty-fifth epoch. He is a native, but amalgamation, civilization and education has robbed him of all the national characteristics of a former age, and he now, in the seventy-fifth epoch, takes a front seat among the thinkers of his time. Strepe and his mother, Honore, are types of the native African. Science, philosophy and the arts are studied as much in this epoch as formerly, but there has been no advance since the fiftieth epoch, as this era reached the high-water-mark of applied mechanics and arts and of practical science and philosophy. After this age the people held their own and no more. The future was speculated upon as much in this era as in the distant past, not only the spiritual and terrestrial, but the celestial received equal attention.

Academy meetings of advanced thinkers were still popular and admittance to them was dearly prized. Among the great thinkers of the day was Strepe.

BREAKING UP.

e was a good speaker and when announced to address the Academy every seat in the great building was filled. His special topic which received much study and investigation was the starry heavens and the announcement that he was to speak before the Academy, on "An Inquiry into the Physics of the Solar System," created a great interest and a crowded audience assembled.

He spoke as follows :

" Mathematics demonstrate the fact that two and two are four, and our reason sanctions it. Mathematics, again, formulates the relation of two foci in an ellipse, or an elliptical orbit, to each other ; but common-sense tells us that if the theory of gravitation is correct the nearer a body passes towards the sun the more it is attracted to the latter mass. The fact, of course, is borne in mind in considering gravitation that the latter is not a property especially inherent in a body itself, say the sun, attracting to itself another body, but exists in the relation between two bodies, requiring two bodies, at least, to create the relation whereby gravitation is made possible. The earth, in December, is at its perihelion, or nearest to the sun ; it then passes in June to its aphelion, or some three millions of miles farther from the sun ; the eccentricity of the earth's orbit, or the difference between its nearest and greatest distance from the sun is considerable, but exceedingly small compared to the eccentricity of the paths or orbits of some comets, a few of which having the aphelion of their orbits beyond the farthest

planet in the solar system, while their perihelion passes within the orbit of Mercury, the planet nearest to the sun, a difference between the nearest and greatest distance from the sun of nearly three thousand millions of miles. If Newton's laws of gravitation are unquestionable, why does not the sun's immense mass attract the comet into itself, if, as claimed, it has power sufficient to attract said comet into his realm from a distance beyond even the farthest planet? Precipitate from a tower, or other high eminence, a huge block of stone; it falls to the earth, but the latter meets it, and in distance just in proportion to the size of the earth to that of the stone; and the only reason that the former body does not fall upon the latter instead of the stone upon the earth is because the latter is so much larger than the former. If, however, the stone were equal in size to the earth, they would meet just half way—both falling equal distances towards each other; if, further, the stone were proportionally larger than the earth, the latter would fall upon the stone, the power of attraction being greater in the latter than in the former; and thus the laws of gravitation are obeyed.

“The moon, although an attendant to the earth, and revolving regularly around it, attracts the earth to itself, however near its proximity to our globe; the sun although ninety-two millions of miles distant from it, while the earth is only the comparatively short distance of 239,000 miles therefrom, the solar mass is of such immense size, some 355,000 times

larger than the earth, its attraction, although at vast distance, governs and controls the moon's movements as much, and some astronomers think more, than does the earth, even in its comparative proximity to us. It is also well known to astronomers that the planet Jupiter, which is eleven hundred times larger in volume than the earth, exercises greater control over its moons than the earth possesses over its attendant, and simply that Jupiter is farther removed from the sun's attraction than the earth, being nearly a hundred millions of miles therefrom, while the earth is but ninety-two and one-half millions; and, furthermore, Jupiter is so immensely large, being the giant planet of the solar system, he holds absolute sway over matter in his realm, embracing millions and millions of miles in space about him; but on account of the comparatively small dimensions of the earth and its nearness to the sun, our planet is obliged to succumb to the attraction or control of the massive solar mass, and be satisfied with the very small narrow realm around it, over which he exercises a partial control.

“Saturn, still farther removed from the sun than Jupiter, and nearly as large as the latter, is subject to the control or attraction of the sun, and of course is absolute ruler over a wider extent of space than Jupiter, although both are more or less tributary to the immensely greater body, the sun, around which they revolve. The attraction of the sun over matter in its realm, or solar system, is very

manifested in the velocity of the planets around his mass. Mercury, the nearest planet to the sun, moves around him with the astounding rapidity of 109,757 miles per hour, the earth moves about him at the rate of 68,000 miles per hour, and Neptune, the farthest planet from the sun, only 6000 or 8000 miles per hour. The influence of the sun over the most distant planet, it must be perceived, is very slight in comparison to the amount exerted over the nearer planets, as seen in the rapidity of their motion in their several orbits. The first law discovered by Kepler, "the radius vector of a planet describes equal areas in equal times," claims that a planet in passing from its aphelion to its perihelion, or nearest distance to the sun, the centrifugal assists the centripetal force and its velocity is quickened, while in its return passage from its perihelion to its aphelion, the farthest from the sun, the centripetal opposes the centrifugal force and consequently causes the planet to move slower. Let us examine this law and ascertain whether both of these phenomena are due to gravitation, and whether, after all, gravitation explains all the motions of bodies in the solar system.

"The centrifugal and centripetal forces we will illustrate by the movements of a horse trained by his master in the field; he is inclined to run in a tangent direction, or in a straight line, right away from his master, but the long and tight rein checks his tangentical or straight course and he is obliged to obey partially the centripetal force which is pulling

him towards his master ; or, in other words, the master pulling one way and the horse the opposite, while in motion, a mean between the two forces or directions is the result, and the horse is obliged to travel in a circular path or orbit, around the master, who holds him in check. While the horse is inclined to fly off in a tangent direction, and the master still holds him in check with the centrifugal and centripetal forces equally opposing each other, a mean between the two will result; and a circle around the centre of attraction will be described. But suppose the centrifugal force, or the horse, gets advantage of the centripetal, or the master holding him in check, the result is obvious that the horse would travel more in a tangent direction. Instead of his path continuing in a circle, it would be parabolic or hyperbolic, and the farther the horse is removed from his master, though held in some check by the long rein, the less control or attraction (through the rein) will the master exercise over him, and who will also ultimately find it utterly impossible to pull him back again, while the force or attraction at the centre remains the same, or is not increased.

“ Apply this illustration to a comet travelling from the sun, whose centrifugal force has gained the advantage over the centripetal and is travelling in a tangent direction from the centre of attraction, as in the case of the reined horse from his master, if gravitation is the sole law that explains its movements, how is it possible for the comet when passing

so far away from the centre of attraction and gravitation, lessening in force in inverse ratio to the square of the distance, to return towards the sun? Again, if the master, or the centripetal force, proved to be the stronger, the horse when travelling in a circle as first described, would be drawn towards the master, and the nearer the horse is drawn to the centre of attraction (the master) the less will be the resisting force of the former, and the greater the control of the latter over him, until at last the horse is narrowed into direct contact with him: and if the source of attraction, instead of being a man, was an ocean, the horse would fall in and be absorbed by the ocean mass. Now apply this illustration to a comet whose centripetal force has gained the advantage over the centrifugal and is being drawn towards the centre of attraction, the sun, as in the case of the reined horse to his master or the ocean mass, and drawn so near by the power of the sun's attraction, as has been observed by some astronomers, that it has just barely escaped touching the sun's mass in passing around it; if gravitation in this instance is the only law that governs its movements, how is it possible for the comet when drawn by the sun's immense attraction almost into its enormous mass (the attraction and control of the latter over the former increasing in proportion to the square of the distance of the comet in its approach to the sun) to entirely escape being drawn into the sun's mass and absorbed, as in the instance of the horse into the ocean mass just mentioned?

“ We find, however, instead of this result, that the comet at this near proximity is repelled with an immense force away from the sun’s mass into space with great velocity, passing in some instances beyond the farthest planet in the solar system. This force is certainly not one of attraction or gravitation, but one diametrically opposite, and what this force is concerns our present inquiry. It has been said, that the cause of every unexplained phenomenon is most sure to be ascribed to electricity, but I do not know as one must necessarily be forever debarred from using this immense and thoroughly universal force in the explanation of certain phenomena because some speculative enthusiasts use it in common in the explanation of all their ideal schemes. Sufficient is it to know that certain facts exist ; that a comet in approaching and nearing the sun, with its tail following it, the latter ninety millions of miles in length, thinner or less condensed than the head, was immediately repulsed by the sun and switched around in the opposite direction, and as the comet rounded the sun and receded therefrom, the tail, instead of following the comet as when approaching the sun, preceded it. To what is this repulsive action in the sun due? We know very well that it is due to electricity, as no other force in nature possesses this repulsiveness to any noticeable extent.

“ Present to the prime conductors of our electrical plate machines some pith balls ; they are at first attracted, and when sufficiently charged with positive

electricity they are repelled; the law of electrical force being that a body possessing less than the average amount of electricity, or, properly speaking, is negatively electrified, when it comes in contact, or nearly so, with a body possessing an excess of ether or electricity, or, correctly speaking, positively electrified, the excess of electricity in the positive passes into the lesser electrified body, the negative, until the latter receives the excess from the positive, or the equilibrium between the two is restored, and both become equally or positively electrified; and when this equality takes place, or both are electrified alike, a repulsion to each other occurs, as is manifested by the pith-ball when coming in contact with the prime conductor, it is immediately expelled by becoming positively electrified.

“The sun contains unquestionably an enormous amount of electricity; the earth, it is well known, is largely charged with it as illustrated by the telegraph. In the early history of telegraphy a “line” consisted of two wires, a thousand miles, more or less, in length; one wire from the battery to its destination, and another, what is called a return wire, to make the circuit or connections complete. But it was at length ascertained that the earth possessed an immense amount of electricity, and by sinking a copper plate at both ends of the line in the earth it was thought the earth might answer for the return wire, and thus the expense of one wire for thousands and thousands of miles be saved. The experiment proved successful, and but one wire was

used in most telegraph lines, thus demonstrating that the earth is a great storehouse of electricity. It is also well known among electricians that lightning, or the electric spark, passes from the earth to the clouds, as well as from the clouds to the earth; if the latter is negatively electrified and the former positively, the lightning passes from the clouds to the earth; if the earth is positive, containing an excess, electricity, or the electric spark, passes from the earth to the clouds. Now, if the earth, a small speck in size in comparison to the great sun (some 1,000,000 times in volume and 355,000 in mass larger), contains so great a store of electricity, what may we expect of the sun if the quantity increases in proportion to the increase of size? and also bearing in mind that the intensely heated or thermal condition of the sun would render it a greater storehouse of this force, in proportion to its size, than the earth.

“ Another evidence demonstrates the fact that the sun is a great storehouse of electricity. Variations of the magnetic needle on the earth have been recorded. Some years the variations have been very great, and some years much smaller; a record, also, of the occurrence of the spots on the sun has been kept, and the magnitude of the phenomenon is found to correspond in both instances. Magnetism and electricity are difficult to separate. In keeping a record of the appearance of the aurora borealis, it was ascertained that the maximum and minimum of intensity for the same number of years correspond

in a remarkable degree to the solar spots and variations of the needle, and the cause of the aurora was conceded by most physicists to be due to electricity; hence, as the solar spots and the aurora borealis appeared about the same time, and with equal intensity, it was fair to presume that the solar spots were largely due to electricity, or electrical action or disturbances in the sun's own mass. We know that there have been tremendous disturbances and explosions in, or on, the sun, that enormous quantities of gaseous matter were ejected or expelled therefrom, and extending from the sun's limb or edge, hundreds of thousands of miles, travelling in the shape of clouds around the sun at the immense velocity of two hundred and seventy miles per second, and if it received a repulsive impulse or attains a velocity over these figures, the mass will pass beyond the control of the sun and never return.

“ Apply this electrical force to the comet. It approaches the sun by the force of gravitation, electricity or magnetism (the magnetic storms and variation of the needle coinciding with the solar spots prove the sun's close relation with magnetism), as the comet nears the solar mass, it being negatively electrified, it receives a portion of the excess of electricity in the sun, sufficient to keep it travelling around and from falling into the sun's mass, and when it becomes thoroughly charged with positive electricity it is expelled or repulsed with great force into space in a tangential direction, and if the repulsive force given it is excessively great it will de-

scribe a parabolic or hyperbolic path, and, perhaps, never return to the region of the sun or solar system again, at least not for thousands of years; if the repulsive force given it is not so great it will describe an elliptical path, and, as in some instances, not pass beyond the planet of Jupiter, or with others, as Halley's comet, will pass but little beyond the farthest planet, Neptune, and when the repulsive force received, or excess of electricity (positive electricity), is expended, the sun's attraction exercises its control over the comet and draws it again in the direction of the solar mass, to be again positively charged with electricity, as it circuits partially around the sun, and repelled as before into space, describing regularly an elliptical or elongated orbit around the sun. What is true of the comets must be true of the planets, for all of them are attracted more or less towards the sun in their orbital motions and also repelled with equal force."

CHAPTER VI.

Marvelo, whom we left in the death chamber and who had shown some signs of life, fell into a trance again.

A day and a night passed and he had not awakened, another day and night and he still slept; no food or drink did he take, they could not arouse him. He breathed, but no other evidence of life was manifest. A week passed and the trance continued, and still another, with no signs of awakening. Honore and Strepe marvelled, the neighbors wondered. Everything that could be done was done. They must wait. Three weeks passed and four, on the thirty-second day a change was manifest, his lips moved, his eyes opened, he made an attempt to speak, but could not, he passed his hand to his wife who clasped it. He then made signs for some drink and nourishment. It was given him. He began to revive slowly, very slowly. Days passed on and he could neither walk nor talk. A season sped by and still another ere his complete recovery.

“Marvelo,” said Honore, “now that you have recovered from your singular attack can you tell us something of the experience that you were passing through. Were you at all conscious?”

"But very slightly," said Marvelo. "I was entirely helpless. It was a strange experience. It seemed like a dream and yet it was not a dream. It was real. I was cold, very cold and do not receive sufficient warmth yet. The earth is cold and growing colder, but very little heat is received from the sun. I shall not be able to stand it long and but few generations will pass ere life in all its forms will become extinct upon the earth.

"By the way, Honore, during my trance everything was revealed to me. I must have lived here ages ago, for all of the experiences and trials in that period passed before me in my trance, and I believe they were actual and real. Why not? In the future life we will look back and recall the scenes of life here on the earth. We do not remember when we were born but we were born, and we cannot in the slightest degree recall the stirring scenes in the first year of our life, but it was real."

"And do you mean to say," said Honore, "that we are re-incarnated?"

"No," answered Marvelo, "not everyone, only a few, very few. After you have heard the blighted experience that fell to my lot when on the earth, and which some day I may narrate to you, you will not wonder at my desire to try my chances for a better time again. It is not impossible that departed spirits in course of time (and time is lost in eternity) inhabit other spheres or planets and a very few who did not have much of a chance while here have a longing desire to get upon the earth again. Most

departed souls choose to march on and on and take their abode among and on other worlds. It is a matter of choice, not compulsive. To enter a lower order of creation upon the earth would be repulsive and altogether out of line of progressive development and hence impossible."

"I cannot," said Honore, "understand re-incarnation."

"Well, my dear," her husband replied, "nearly all things in life, on the earth and throughout the universe are made up of circles. The planet which we inhabit is a circle and so is our vision, as we stand upon the earth, bounded by a circle, the horizon."

"Why is this?" inquired Honore.

"Because," her husband replied, "if your vision is unobstructed, the extent of view is equidistant, whether you look at the north, south, east or west; you occupying the centre, the length of vision is the same and of course a circle around you is the result, and so it is with objects upon the earth. How would a square horse look, or man or fish or any other animal; the forms of all the animal kingdom are rounded or circular. So it is throughout the vegetable kingdom: take the tree, the potato, the corn-stalk and the ear of corn,—the plant and even the seed are rounded or circular. The raindrop is circular and so are all drops of liquid. Take the universe, what would you think of a square moon or sun and starry heavens, how would a square star look? No, everything in the firmament is circular, even the orbits or paths of the earth, moon and

planets perform a circle and the same is true of all the other stars. The North star, the pole, or present centre of our starry vault, around which all of our stars apparently travel in their nightly march, performs a circle. Even our storms upon the earth's surface travel in cycles or circles. If then this is the law of the universe, is it not probable that the spirit of man can obey the same law and travel or move in cycles? As his body is rounded it is possible that the development of his spirit may be. Man cannot comprehend the growth of spirit throughout eternity, where the extent of time is no factor in the movement. Is it not more rational to consider that the same universal law of cycles or circles can round the march of spirit or its development and bring it in its cycle around again within the sphere of the earth in the course of ages, from whence it apparently started, or if not the earth, some other planet inhabited? Like the eccentricity of a comet's orbit, some of them having parabolic orbits, making their appearance in our heavens in their cycle around us only once in a century or centuries, or as in a hyperbolic comet, constantly moving through space, returns only once in several hundred thousand years. The re-introduction of souls to earth in their cyclic journey through eternity I cannot explain or comprehend, any more than I can how a living soul or spirit appears and makes itself manifest in the inception and birth of an infant."

"In the beginning of this discussion," said Honore, "you stated that while in the trance all of your former life was presented to you."

"I did," answered Marvelo, "it occurred ages ago. Thank heaven! the world is progressing and the barbarisms of the past are buried out of sight, save in the history of the earth's development.

"I was a negro, born here in the heart of Africa, not far from where we now live and how changed is everything. Then it was the centre of heathenism and barbarism, now it is the paradise of culture and intelligence. Wild animals roamed the region about here abundantly. Pelicans and cranes four or five feet in height were sporting about the shore, water fowl, wild geese and ducks fed quietly about us, elephants of gigantic size would crush the young trees and bushes as they passed over them, lions, tigers, leopards, panthers, droves of hyenas and enormous snakes abounded. Sometimes great overflows of water would cause them to retreat into our villages and woe to our people when this danger was thrust upon us. Our food was limited to few varieties, no vegetables except the onion; no fruit cultivated except a few limes. No wheat or rice was grown, but instead a small grain which was boiled and fat poured over it. This was a luxury in those times. Our manufactured goods consisted chiefly of cotton cloth, colored with indigo. After it was steeped three times in indigo it was spread out on the trunk of a tree and beaten with mallets of wood, which gave it a gloss that was very brilliant. The currency in our region was made of iron and also coral, amber and glass beads were used. The Sultan was our ruler, and honey, leopard skins and slaves were

offered to him as a tribute. In our battles with neighboring tribes we fought nearly naked, wearing a skin only around the loins. The arrows of the enemy were kept off largely by a shield, they were poisoned on the tip end and when they pierced an enemy death was sure to ensue. We went forward in a body with our spears, a number of pickets marched in front and with a furious war-cry we charged the enemy; the clashing of the spears against their shields added to the fury of the scene and victory or death resulted. Our fortifications were peculiar, a number of holes, broad and deep, were dug into the earth. The surface was carefully covered with sods and grass and so concealed were these holes that it was almost impossible to detect them. When the enemy rode along on their camels, if they stepped on these traps the camel and the rider dropped to the bottom of the hole on sharp pointed stakes which made it all the more difficult for either to escape. For our chiefs we held a blind and superstitious veneration. The form of government was despotic. Our monarch maintained a great number of wives, which he often boasted would reach hand in hand across the kingdom. Our camps consisted of a number of huts, presenting the appearance of beehives, with streets running around them."

CHAPTER VII.

“ We were celebrating on the island,” said Marvelo, “ our chief’s birthday. Men and women participated ; drums were beating, music and dancing were in the order for the day. We ate, drank and were merry. I was seated by my cousin, helping her to some of the luxuries of the table when we were startled and terrified by the approach of armed men.

“ Instinctively we knew what they were and what they were there for. An African, a negro, when he discovers a body of armed strangers approaching stealthily towards him knows they are slave catchers. We scattered and fled for our lives, we gained the woods and hid in caves and other places of concealment, and after several days’ search our would-be captors left the island and sailed away for other ports.

“ We left the island and took up our abode on another, where we built huts and felt safe and secure in our new homes. I was appointed chief. We were a contented and docile people and were much attached to our relatives and friends. We were happy, but alas ! it was of short duration. A ship

was anchored on the coast; a company of armed men landed and approached. Terrified we fled hither and thither. There were no caves on this island to conceal ourselves. They burned our huts and destroyed our food. They gave us chase and captured a few of our number and carried them in chains to their ship. Every day they came on shore and succeeded in capturing a few; to resist them was death to us, for we could do nothing with our spears and arrows in open field against their rifles at long range. At length they succeeded in capturing most of the inhabitants of the island numbering about two hundred, including women and children. The maimed and the sick were left behind, also the aged, as they were of no use to them and would not bring a paying price. The latter begged that those who had the care of them might remain for they would perish without them, but it was of no avail,—not a spark of humanity was manifested. The heart-rending cries of the aged and sick remaining and their kindred on the slave-ship were terrible to hear. I was not captured with the others, for I succeeded in keeping from their view in my hiding place; at last when two of them espied me, I sallied forth with my spear. I plunged it into one and he fell prostrate before me; the other I grappled, it was life or death between us. He drew his pistol from his belt, pointed it to my breast, but just as he was about to pull the trigger my hand clutched his throat and with a herculean grasp I choked him and fled. I dropped my spear and clung to my boomerang. I

was discovered running and was pursued. I ran towards the coast and as I reached it, I turned about and threw a boomerang at my nearest pursuer, it struck him in the abdomen and he fell. I had one left and aimed it at the next, he dodged it and it fell harmless to the ground; he and his fellows kept on. I dove into the water, and came up to the surface sixty yards distant, as soon as my head was exposed I saw them level their rifles at me. I dove again and remaining under as long as possible I arose to the surface and this time I was shot in the arm, and made slow progress in getting along. A canoe was on the shore, it was manned by three men, they rowed towards me, one of them approaching aimed his pistol at my head and threatened death if I resisted. I knew they did not care to kill me, for I was large and muscular, quick and courageous and that made me chief. I would bring a large price as a slave, hence they did their best to capture me alive. As they came up with me with their canoe and were about to pull me in, I caught hold of the side, ostensibly, to pull myself in, but mustering all the strength I had within me I jerked the boat and she capsized, and my three pursuers went down. I left them to their fate and swam for the shore as no one was visible at the time, but as I neared it three of the gang put in an appearance; they had observed, it seems, from a distance the capsizing of the boat and made haste to the rescue; by this time I was pretty well exhausted and as I gained the shore, being without a weapon, I ran from my pursuers,

but a ball shot through my leg brought me to the ground captured. I was put in irons and taken to the slave-ship and amid the cries and wailings of the aged and sick on shore and their friends aboard, the ship sailed and we were upon the deep. I was carefully nursed, and in the course of time my wounds healed.

“Our destination was Brazil. The slave trade at this time was enormous. A company in England, sanctioned by the King, agreed to supply the West Indies plantations alone with 3000 negroes annually.”

“What,” said Honore, “3000 negroes annually! Is it possible that among civilized nations such inhuman atrocities were allowed?”

“They were, and for many years,” answered Marvelo. “Why 3000 negroes were but a trifle. Something like 200,000 were captured from Africa annually, conveyed and sold to some of the most civilized nations on the globe.

“But to return to my story: I was an eye witness and know whereof I speak. We were crowded like cattle into the hold of the ship. We met a Portuguese vessel bound for Brazil with 1100 slaves, 500 of whom died of disorders contracted by poor ventilation and the excessive heat of the tropics, and probably a greater part of the remainder did not long survive their arrival in port. As our ship approached the equinoctial line a frightful malady broke out. At first the symptoms were slight, little more than a redness of the eyes; this being

confined to the slaves it was ascribed to want of air in the hold, and the narrow space between decks, into which so large a number of these unhappy beings were crowded. It was thought to be due in some measure also to the scarcity of water, which had thus early began to be felt. By the surgeon's advice, therefore, we were allowed for the first time to breathe purer air upon the deck, where we were brought one after another; but many of my people being so homesick and seasick no sooner found they were at liberty than they threw themselves into the sea, locked in each other's arms, in the vain hope known to prevail among them of thus being swifly transported to their homes. With a view of counteracting this propensity the captain ordered several who were stopped in the attempt to be shot or hanged in the sight of us, but this terrible example was not sufficient to deter them, and it became necessary once more to confine us in the hold. We were attacked by a disease known as the virulent ophthalmia, and it spread with irresistible rapidity among the slaves,—all of us were seized with it.

“The crew were next attacked, the resources of medicine were unavailing; our sufferings and the number of the blind daily increased. The consternation on board our ship became general; thirty-six of the captives having become totally blind were thrown into the sea and drowned in order to save the expense of supporting slaves rendered unsalable. At length we reached Brazil in the most wretched condition. The only one of the crew who escaped the

disease had thus been enabled to steer the vessel into port, and he caught it three days after our arrival; thirty-nine of the remainder of my fellow captives had become totally blind, and many others, including myself, had lost one eye. The captain and four sailors each lost an eye; yet so strong was the thirst for money that in the following year the vessel was again commissioned and the same commander sailed in her to ravage the hamlets of Africa unappalled by the horrors through which he had passed."

"Was not your ship," said Honore, "an exceptional case of hardships; can it be possible that there ever was a period in the earth's existence when its inhabitants were so cruel and inhuman?"

"Yes, my dear, those cruelties were common in that age, the thirst for gold was so intense. Of course, in this epoch, the seventy-fifth, the moral and religious nature of man is so changed, and his intelligence, generosity and humanity are so great, you cannot realize that these monstrosities in human conduct ever existed, but history will substantiate every word I say."

CHAPTER VIII.

“ Many years after my landing in Brazil, I met an African who was captured in the same manner as we were, but gained his liberty, and unfortunately was captured again. His case was worse than ours ; on his first trip he was conveyed in a French vessel, and an English war-ship gave them chase, and boarded her. It was at that time against the law to capture and carry slaves, but it was done nevertheless. The captain admitted to the English commander that he formerly was engaged in the slave trade, but denied that he had any slaves on board at present, declaring that he had been plundered of his cargo. The English officers, however, observed that the French seamen appeared agitated and alarmed, and this led to an examination of the hold ; nothing was found and they would have dismissed the Frenchman with the belief that the captain’s story was true, had not a sailor chanced to strike a cask and heard or fancied he heard a faint voice within. The cask was opened and two negro girls were found there in the last stage of suffocation. An investigation now took place and it was ascertained that they belonged to a cargo of fourteen slaves, whom the French

captain had captured. This led to a new search of the slave-ship, when a platform was discovered under which the slaves were stored in a space twenty-three inches in height. To avoid suspicion and detection the captain of the slave-ship on seeing the English man-of-war in the distance approaching threw overboard twelve casks, containing twelve slaves and left them to their fate. Our craft on touching the coast of Brazil sailed up the river Parahubá and then up its tributary Gorguea. We then embarked and were conveyed to the diamond districts in the province of Matto Grosso. I will not trouble you with a recital of my life spent in slavery; sufficient is it to say that I passed through the same experience, the same trials, the same sufferings, as thousands of other slaves, with which history has made you familiar, with one exception however, I would not be whipped."

"How could you prevent it?" asked Honore.

"My pride would not allow it. As I told you I was chief of my tribe when here in Africa, and to whip a chief before his people on the plantation was too much. As a slave I cared not to live and would fight to death's door before I would be whipped. I was too valuable to my owner to be killed; I worked willingly and well, but I could not stand an insult. We were working one day in the diamond fields; you may not know that in searching for diamonds we have to work among coarse gravel and pebbles, which are scattered upon a bed-rock, at the bottom of a stream,

which was worked in the dry season when the water ceased to flow. The gravel is removed into a shed, in which boxes are placed and there it remains until the wet season begins, and then through these boxes a small stream of water runs to wash the gravel. A slave stands at each box and works the gravel over, washing out all the impurities. Overseers are stationed in each shed to carefully watch the movements of the slaves and see that they do not conceal any diamonds. My cousin, a good and beautiful girl, was working at a box adjoining mine. It is the practice that when a slave finds a diamond weighing seventeen and a half carats to give that slave its liberty. Of course it was very rare that a slave would find as good a one and especially so in the fields of our district, for here the diamonds found were not large, but were of the purest water and have a more brilliant lustre than any diamonds in Brazil; but once in a great while they were found and with it the slave's freedom. It was a find that all slaves through a lifetime prayed for. Well, one stormy day when the air was full of melancholy, the wind whistling through the trees with a moan, I was thinking of happy days at home. I glanced at my cousin at work by my side; how I pitied her! Work, work, work, she was working her life out; emaciated and weak, it was difficult for her to complete her day's work, she suffered. I proposed to the overseer that I should do her work, and mine, that she might get a rest, but the cruel man said no! that I had got to work like the devil any way. All

at once I heard a scream, not like one coming of pain, but of joy. I turned to my right and beheld a rough diamond in my cousin's hand; it was a big one. I at once saw the poor girl had secured her liberty. I was overjoyed. A slave at the next box observed the find and in an instant stealthily snatched it from my cousin's grasp and dropped it into his box; the thief saw me go for it and snatched it up again. As quick as thought I clutched him and hurled him to the ground, struggling for the diamond. Overseers have favorites and the thief was his favorite. He told me to get up. I obeyed and then appealed to him and said that the diamond was found by my cousin; that I saw the thief snatch it from her and prayed that he should compel him to return it. The overseer said it was false, he saw Pete (the thief) take it out of his box, and it was his find, and should be entitled to his liberty. At this my cousin fell to the ground in a swoon, it was a terrible blow to her, poor girl, with liberty in her grasp, to be stolen by a miserable thief. She revived and prayed to the overseer, with tears streaming down her cheeks, to return the diamond. He commanded her to keep quiet, and told her if she dared again to claim the finding of that diamond, he would whip her to within an inch of her life. She could not, poor girl, keep silent and she moaned again about the loss. At this the overseer with fire in his eyes raised his whip to strike her. I saw the act and with the strength of a lion and the ferocity of a tiger, I

sprang upon him, and in an instant we were tumbling upon the ground. I clutched his throat and would have strangled him, had he not begged to be released, promising he would not whip her, but before I arose I was seized by another overseer who rushed to the scene and by the efforts of both I was bound in ropes and led into the presence of my owner. He was informed by the overseers of my insubordination and notwithstanding my explanation, it was decided that I should be severely whipped on the following morning.

“Morning came, but during the night I did what I could with my strong teeth to weaken the ropes with which I was bound. I did not succeed in separating them, but I made quite a gash in one. I was led out by the two overseers who were to administer the whipping. They stripped me of my clothes and were about tying me to the tree, when with a mighty wrench I broke the rope that fastened me and with the bound of a leopard I gave one of the overseers a blow from my fist which sent him headlong into the dust, and as the other was about seizing me I gave him a blow between the eyes which sent him tumbling over his prostrate friend. I did not tarry to see what could be done to revive these poor unfortunates, for as they lay quiet I thought it best to see what could be done for myself and I struck a bee-line for liberty. I aimed for the woods and succeeded in getting into the midst of them, but soon I heard that sound, which is the dread of the slave, it was from the blood-hound. I

turned and saw him approaching, there was but one ; I dodged here and there and was lost to his view but it was no use, he scented me, and turning about we met ; he lowered and with jaws wide open, in one bound, he sprang, but before his huge teeth were fastened upon me my hand was in his mouth, clasped around his tongue I held it like a vice, and with the strength of a Samson I started it from its roots ; the dog released his hold and with an unearthly yell he retreated as fast as his legs would allow him. My purpose now was to strike for Bolivia and for liberty. It would take days to reach it, but by hiding and sleeping during the day and travelling by night, living on tropical fruits, I thought it possible to accomplish my purpose. Day after day I neared the end, and no great obstacle seemed to obstruct my path. I at last realized that I could not be far from the line dividing the two countries. But a few hours more and I should reach the goal and be a free man.

“ What’s that ? with bated breath I screamed ; a man on horseback at full speed was approaching me. I was horror stricken ! it was my master. With one foot almost on the threshold of liberty, must I lose it, to be caught, returned and whipped mercilessly ? It was liberty or death to me ; a thought as swift as lightning struck me. I had upon my shoulders and back an old cape. It was lined with bright red. As the horse and rider approached within a few rods of me, I snatched my cape and shook it in the air, with the red lining towards the horse. The

beast reared and plunged with fright and threw my pursuer heavily upon the ground ; the horse ran and so did I, neither I nor the horse looked to the right or left, we left our master prostrate. How I ran, I almost flew. I had been on the border years before, and knew the boundary marks. I could see them now, a few moments more and I should reach them. I sprang forward, leap after leap. I looked behind and with another leap I struck the soil of freedom and was a free man, and then I looked up to God and with my heart full of joy and gratitude I poured my thanks out to Him and went on my way. A twelve month more and a rebellion broke out in Brazil. I then thought there might be a chance for my cousin to gain her liberty. The rebellion extended from the borders of Bolivia towards the interior of my former country. Willing to risk my chances, I joined the rebels with only one thought and that thought was to free my dear cousin. The civil war was progressing and the rebels were carrying everything before them. They had nearly reached the diamond fields where my cousin was working and where I had worked. I fought as I never fought before ; all the forces that both sides could muster were pitched against each other in this battle, both fought like tigers, but the rebels were victorious and our enemies fled. The slaves in the diamond fields ran toward us, they knew our forces were their friends. How eagerly did I watch to see my cousin. I looked here and there among the fleeing slaves, but I could not see

her ; at last I hurried to the rear, where two or three were straggling along, but she was not there. I hastened farther on, and in the distance I espied an object sitting by the side of the road ; I ran—it was none other than my poor cousin. Weak and weary she could go no farther. I clasped her to my breast and lifting her in my arms I carried her to my tent. For bravery in the field I had been promoted to a captaincy. The rebellion ended, and Dinah (for that was her name) gained her freedom. We wedded. A year or more after that event I was attacked with the yellow fever and died suddenly ; so you see my advent upon the earth at that time was not enjoyable or profitable. Then barbarism was on the rampant, and I had to meet it ; now peace and good will is the ruling element and I shall enjoy it and profit by the experience as I could not before.”

“ Well,” said Honore, “ you have taken rather a cold time for it.”

“ True,” said Marvelo, “ but it is better to be late than never.”

CHAPTER IX.

At Tibesty, situated in the central portion of the Great Desert of Sahara, and near the northern boundary of the Torrid zone, are the ruins of a nearly deserted city where the former inhabitants have either died or migrated to a more southern clime, the cold had become so intense it was impossible to longer endure it. There were some exceptions however, where extreme hardiness allowed now and then a family to remain. There was no vegetation here and little could be grown under glass. Even under the equator nothing but a few stunted birch, alder, willows, mosses, fungi and lichens grew. The only animal food they could secure was what could be obtained in lakes, and in the sea under the equator. Of course to obtain a living with these obstacles to encounter became difficult, for in the interior of the continent, away from large lakes and the coasts, the distance added to the cost. Again, food of this description was becoming scarcer as the increasing cold was bringing the limits of open water gradually into smaller areas. In this desolate city that once contained 500,000 souls, there were now only a half dozen

families containing in all twenty-four persons. One of these families had consumed the last morsel of food. Their love of home was so great, they failed to seek a warmer clime. Others had left, but these remaining families had persuaded themselves, that it was better to remain at home and die, than to leave and then very likely die among strangers.

The family referred to were out of fuel to warm them. There were no trees to get fuel from, nor coal to burn in this age as it had become exhausted. Their artificial heat was obtained from the oxygen of the water, and where that was frozen, it was obtained from the air; hydrogen was also secured and used. These elements were separated on a large scale by chemists and compounded slightly with such other elements as would make them safe and useful, and then used for the cooking of food and warming dwellings, conservatories and out-houses. From the want of food they did not possess the strength to make fuel to burn. One of the family was a three-year-old child. It was weakly and its cries for food were terrible to hear. The father went in search of something, but failed. Then the child grew cold and moaned for warmth. The houses were built of stone and the mortar was compounded from the earth, hence no fuel could be obtained from deserted houses. The father made an effort to make some fuel of oxygen, but in the absence of food this did not give the poor child strength and it wasted away and died, and ultimately one by one the entire family passed to the other

life. The remaining five families followed them before the close of the year, and Tibesty, the once flourishing city of the Great Sahara, was no more ; it was the city of the dead, and what was true of Tibesty soon became true of all the cities and towns throughout the once Great Desert, and desolation did not stay its hand here, but passed through the entire belt of the Torrid zone circling the globe.



FOURTH BOOK

✦ 100th EPOCH ✦



11

12



FOURTH BOOK
✦ 100th EPOCH ✦





CHAPTER I.

This is the one hundredth epoch, and the end of life upon our globe, not only of man, but the entire animal and vegetable kingdom. The moon has had its day, when its entire surface is supposed to have been inhabited, but long before any form of life developed upon our planet and before man, the last phase of animal life appeared, the moon was in its dotage and life there became extinct. This is proven, as far as man can prove anything so distant, in two hypotheses; first, the moon being some four times smaller in diameter than the earth, it did not take as long to cool off, condense and become sufficiently solid at its surface to support life. Then again no astronomer has been able to discover with the most powerful telescope any water or air about or on the moon, and this fact is again confirmed by the occultation of a fixed star, between which and us the moon passes, no dimness of the star is observed as it approaches and passes seemingly behind the moon. If there was air surrounding it as with us, that dimness would be observed as the star apparently passes through it. If there was water it could be seen. So will the earth ripen, and water and air

dissipate into space, and life must then become extinct as upon the moon. Perhaps it is possible some of my readers are not sufficiently familiar with the accepted theory of the formation of the solar system to make plain to them the argument which I follow in these pages, hence an explanation.

Most scientists are agreed in the opinion that the globe which we inhabit, originated from a nebula, a gaseous mass similar to the nebula in various starry constellations, which can easily be seen on a clear night through any small telescope, appearing like faint clouds. This nebula comprised the entire solar system, with the sun for its centre, and its outer edge, Neptune's orbit, being 2,862,000,000 miles distant from the sun, and the diameter of which is some 5,700,000,000 miles, gives us a partial idea of the immense size of the great nebula, gaseous nebula which extended throughout the system mentioned. At last in the process of time the molecules or particles composing the nebula are disturbed, separation takes place in form of rings from the central mass, the sun. These rings finally break, and separate masses of each are attracted towards a central mass; in the path of each ring, a globe is heated together, a separate existence is given to each planet in our system, and each speeds in its orbit around the central mass, the sun. The earth, though separated, is yet a gaseous, cloudy, vapour-like mass, but the heat which holds its particles together in the gaseous state is partly expended or radiated into space, and in losing a portion of its heat, con-

sation takes place, the mass contracts, becomes smaller, it is converted into a liquid, the same as the vapor of the atmosphere is converted into rain through the same cooling process. In the conversion of this great gaseous into a liquid, it takes the form of a round globe, the same as a rain-drop formed above. This is the law of all liquids forming in the air, to assume the shape of a globe or a rounded mass. In progress of time the surface of this liquid globe has expended a considerable portion of its heat into space, and a thin crust is gradually formed, a scoria, light as ashes, and porous, similar to the scoria found on the side of a volcano after eruption; it continues to grow more solid, like the lava which, flowing from the active volcano in a liquid state down the mountain side, condenses, and ultimately hardens into a solid rock. The water portion of the earth remains in the air surrounding the globe in a state of vapor, because the excessive heat of our planet vaporizes it. At last, when the earth crust was sufficiently cool to allow the rain-drops to remain thereon water began to accumulate, until the earth became surrounded with one vast universal ocean.

This was not the work of a day or of six, but ages must have elapsed between these stages of transition or development. The astronomer has simply to point to the rings of the planet Saturn to substantiate, in a measure, the nebula theory of our globe. Surrounding that planet there is a system of rings, which are unquestionably composed of gas, a

nebula. They probably were thrown off from Saturn, the same as the rings which formed the earth, and other planets were thrown off from the sun. It is conjectured that these rings about Saturn, through the process of condensation and contraction, will break and form another system of moons around the planet, similar to the breaking up of the earth's ring around the sun, and consolidating into the globe which we now inhabit. Our moon is supposed to have been thrown off and condensed in a similar manner during the early stages of development of the earth. The geologists point to the interior of the globe for evidence of the fluid and nebula condition of our planet. The earth is being created to-day just as rapidly as thousands of years ago. It is yet young, although some two hundred million years of age. Earthquakes and volcanoes must cease ere our planet is fully developed. The crust is very thin. The interior is constantly solidifying, so that in the course of millions of years it will become one solid cold mass. When this takes place, earthquakes and volcanoes can no longer exist, as this condensation process is continued, the earth, from necessity, is diminishing in size. One has but to travel over the face of our planet to discover the fact that its development has but fairly commenced and that man must to a large extent be the instrument to perfect it. Not one-thousandth part of the land of our globe is cultivated. Every inch of ground must be tilled and made to return one hundred, aye, one thousand fold more product to its

inhabitants than in the past. Stagnant ponds must be drained, and beautiful farms flourish upon their beds. All space except very large bodies of water upon the planet must be turned to our best advantage; then, and not till then, will paradise be gained and the grand old earth attain a ripe age. Turn to the stars and watch their motions in space. Day after day; year after year; century after century; thousands upon thousands of years roll on, without any perceptible change being apparent in them, yet the change going on is constant, but the existence of man on the earth is so brief compared with the development of our planet, that men cannot ordinarily measure the growth and decay of these bodies. The earth is but one seventeen-hundredth as large as in infancy. Births and deaths of worlds in the universe are of common occurrence. Humboldt tells us that if the elevated portions of the earth continue to wear away as rapidly as at present, in two million years the earth will be levelled to the sea, and then what of life upon its surface? Nothing left but the fishes of the deep. The telescope reveals each day great changes at work in the immense mass of the sun; it is now a gaseous, incandescent mass, rolling and seething like a boiling caldron. That it expends its heat rapidly we know by the amount received upon our globe daily, and we receive but a small portion of it in the length and breadth of the solar system.

The time is sure to come when it will have expended most of its heat and ere this period arrives

it will have become sufficiently cool and solid to evolve life upon its surface which will derive its heat mainly from within the sun and from fuel without, and like the earth become inhabited. Neptune, the most distant planet from the sun, and its only sun, receives but very little light and heat therefrom. Not but little more than we receive from the largest fixed star, a distant sun. All the fixed stars in space are known to be suns with planets revolving around them as those around our sun. How infinitely vast are all the changes taking place throughout the universe. To prepare a planet or sun for the inhabitancy of man or any other living being is a long step, and after this step has been achieved, it must have taken millions of years to mature the elaborate frame and perfect the vast, intricate and matchless system of nerves and brain of man.

I am old and ancient, the history of the earth is my history, the development of the solar system is my development, the changes in the universe are but changes in the great whole of which I have been, am, and ever will be a part and parcel. How vast then must have been the transition in the development of man's body alone in evolving from the lower to the higher through the line of ages in the past. It simply contributes to the long chain of evidence in support of the eternal law of transition throughout all forms of matter. The sun and planets have been developing and, in this last epoch of which we are writing, have largely developed, and some of

them entering the stage in the introduction of life upon their surfaces.

And why should they not? for they came from the great central mass from which we emanated and separated, they are bone of our bone and flesh of our flesh. Their great mass, so many times greater than ours, took them longer to expend their heat, and sufficiently expended to develop life upon their surface. Think of the vastly superior mass of the sun to our own mass, being some 1,400,000 times larger in volume.

CHAPTER II.

The sun and planets, of which we were part and parcel, contain the same properties that our earth contains as confirmed by the spectroscope, one of the most important aids to astronomical science that has been given to man in this century. It is an instrument with a prism and three tubes, used by chemists for chemical analysis, and by astronomers for the analysis of the stars. The sun is found to contain sodium, iron, hydrogen, magnesium, copper, zinc, calcium, nickel, etc. The common origin of bodies in the solar system is substantiated through spectrum analysis, as comprising most of the elements the earth contains. Most of the stars examined contain properties that contribute to the support of life. If then our planet was originally a fiery liquid, or vapor mass, all manner of forms now upon it, man, beasts, trees, rocks, all were one and the same in this universal boiling caldron.

Analyze the grave after the body is entirely decomposed, and the most skilful chemist cannot detect the faintest trace of the body as distinct from the earth. The muscles of man contain soda, blood, potash and iron; bones, lime and phospho-

rus ; hair, silica ; brain, phosphorus and magnesia ; the body in general contains also oxygen, hydrogen, carbon, nitrogen, chlorine, albumen, etc., elements common to beasts, plants and soil. These elements, as we have seen by spectrum analysis, the sun also contains in sufficient quantities to develop life when its mass has sufficiently cooled. These conditions are being met at the one hundredth epoch of the earth's existence, when the sun has ceased giving light and heat. There is one favorable condition, however, that the earth was blessed with in developing life which the sun does not possess, and that is the reception of any considerable amount of heat from any outside source, as for example the reception by the earth of heat from the sun, while the latter receives no heat to speak of from without. It receives a very small amount of heat and light from the stars and so does the earth, but we can see and appreciate how much this is on a bright and a clear starry night, and then again it is difficult to comprehend how life can flourish upon the sun without the light and heat that we upon the earth receive by day from it. The latter has no other sun to send its rays of light upon its surface, but life is possible without it, for we see the Greenlander and the Laplander has but little of the sun's light or heat during the year, but they live and flourish without it. Again, the enormous mass of the sun containing, even after a crust is formed upon its surface, such an immense amount of hot molten mass in its interior, the heat arising therefrom will necessarily be considerable,

sufficient for many millions of years to develop and support life upon its great surface. What the class of inhabitants will be is not for us to say. It is probable they will be very unlike the inhabitants of our planet, for the conditions, such as the absence of any considerable amount of heat and light from external sources as above referred to, change the direction of development and its results. What is true of the animal kingdom must also be true of the vegetable. The absence of light and heat from without must necessarily change the nature of vegetation. That there will be vegetation, or food of some sort to feed and contribute to the support of life, there can be no doubt, but what form it will take is beyond the powers of conception.

Before the age or epoch of which we are now speaking, and before the sun becomes inhabited, those giant sister planets in our solar system, Jupiter and Saturn, will be inhabited. It is claimed by the most eminent astronomers, that at present they are a gaseous, incandescent mass, something the same as was our earth before a crust was formed around it, in a state of vapor. Jupiter has four moons (and recently five are claimed), secondary planets, revolving around him, and it is not impossible that these moons are now inhabited, for as Jupiter is more than four times as far from the sun than we are, the heat and light received from that body is twenty-six times less than we receive, but then there is perhaps a compensating equivalent, for Jupiter to these moons furnishes from its incandescent mass, heat

and light enough to counterbalance any deficiency from the sun, and Jupiter itself is a secondary sun to these satellites. This planet is some eleven hundred times larger in volume than our planet. Saturn is also a gaseous, incandescent mass and has eight moons revolving around him, and it is also possible that these moons are inhabited. This planet is some ten times farther from the sun than we are, consequently it receives but a small fraction of the amount of light and heat from the sun that we do. But the secondary planets of Saturn receive their light and heat principally in the same manner as did the satellites of Jupiter, and that is from the secondary sun around which they revolve. Notwithstanding Saturn is not as large as Jupiter, receiving a much smaller amount of heat and light from the sun, yet this loss is somewhat compensated by the immense rings around this planet which are some 27,500 miles in width and is only one-twelfth as far from the planet as our nearest neighbor, the moon, is from us.

The amount of heat and light Saturn's moons must receive from these rings is quite considerable. These satellites, if inhabited, enjoy what no other bodies in our solar system can enjoy, for these rings above them, surrounding Saturn, must present a grand and matchless sight. They belt like a rainbow the sidereal heavens, added to which are seven other moons to illumine the heavens and all passing through the same phases our own has seen.

Uranus and Neptune, the two farthest planets in our solar system, are also gaseous masses and are not

as large as Jupiter or Saturn, nor do they have many moons; and the planets are so far distant from the sun, it is doubtful whether the heat and light from that source would ever develop life on their surfaces. The sun, to any one standing on Neptune, would not appear larger than the nearest star, as it is distant from it some 3,400,000 miles, while we are only about 91,250,000 miles therefrom. Their moons, however, may be inhabited, receiving their light and heat from their central planets, Uranus and Neptune, around which they revolve and which to them are suns, and it is possible that when these planets have sufficiently cooled as to form a crust over the surface heat enough may be evolved from its hot molten mass within to develop and sustain life, and the same is possible on Jupiter and Saturn.

The other planets in our solar system, Mars, Venus and Mercury, we have yet to mention. Mars is the only planet at the present time among the primary planets that is likely to be inhabited. Mars and Venus are nearest to us. The telescope reveals many things upon Mars which makes it possible it may be inhabited. Snow is discovered upon its surface, and if snow, there is rain. Lakes and large bodies of water are supposed to exist there. Most other conditions are the same there as upon Earth, planet, and conditions that are necessary to the development and the support of life. Venus was thought not to be inhabited, as the necessary conditions have not as yet been found to exist there,

then it is between the sun and our planet, consequently, observations of its surface are not as clearly and distinctly made. The same is true of Mercury, which is still nearer the sun; so close is it that it becomes difficult to detect anything upon its surface. If it is inhabited it must be very hot for them. We cannot see how it is possible for an inhabitant to live in so hot a place, and it is equally impossible to conceive how an inhabitant can live on Neptune, the farthestmost planet in our solar system, because of the extreme cold suffered there. At the distance of Saturn, it is thought to be some one hundred times colder than we experience upon the earth. Consequently, with the extreme temperatures at either end of our solar system, hot and cold, if the conditions for the development and sustenance of life were the same as upon our globe, life at these extremes would seem impossible, but how narrow is our experience on this little planet, the earth. What do we know of the necessary conditions for evolving life upon other planets? They may be entirely different from our own, and to the inhabitants of those planets, our conditions, were they known to them, might seem unbearable and insufferable.

It is not probable that our planet alone among all the others is the only one situated at just the right distance from the sun to develop life. Does it not appear probable that all the planets, including the sun, will possess, sooner or later in their existence, the necessary conditions to develop life, not forgetting the fact, that larger bodies, such as the sun, Jupiter,

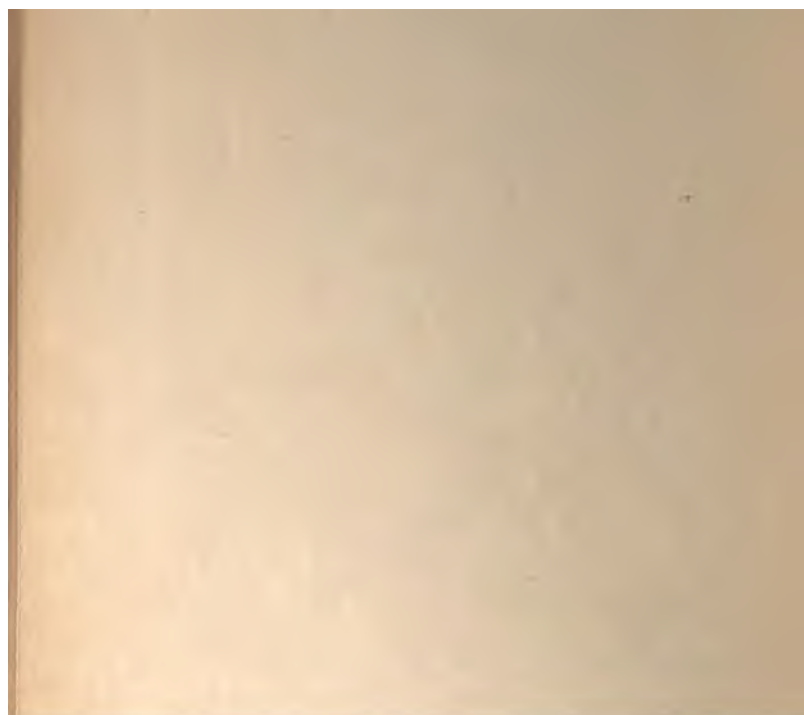
Saturn, Uranus and Neptune, develop and mature much slower than smaller bodies, like the earth, Venus and Mercury? And again, what are these planets formed or created for unless for the purpose of developing and supporting life on them? Did they come by chance and for no other purpose than to toss about in space with nothing but gas or rocks for the ages to butt against? And does our solar system contain the only heavenly bodies among millions of other bodies, marching on in the boundless universe, that can and do support life? Our arrogance is not sufficient to say aye. The economy of nature is too great and exact to give us reason to calculate upon such stupendous waste.

Why was our planet formed unless for the development and support of life? It has no other object and can have none other, and the same must be true of all the bodies throughout the length and breadth of the vast and mighty universe. When in the one hundredth epoch of our planet's existence the interior of the earth has spent its heat and the sun's surplus rays in his development cease to strike us, and all forms of life of necessity, from the absence of heat and light, cease to develop and live on its cold, frigid surface, the old earth must die; it has had its day, it has served out its term of usefulness, it is broken up, and as it can be of no further use in its present form, it must disintegrate, break up in the process of time and return to its primary condition, passing into the nebula state, and eventually contribute to form another world or worlds

and thus pass on in the cycle of change through endless time and eternity, round and round in obedience to the laws of universal motion and unrest, seen in all bodies on the earth and throughout the universe.

Worlds are being born to-day as in ages past. Man's life upon this planet from the first is but a drop in the bucket, and his observations in the heavens, in the detection of the slightest trace of such changes, are as nothing. And it is also true that the birth of every world must follow in the march of all material things, large or small, and die, must die as man dies, and its present form pass out of existence as does man's earthly form, and this must be true throughout the universe. The rock forms and solidifies from a once soft and plastic mass, and in the process of time it decays and crumbles to pieces, through the action of water, temperature and air. Change is stamped on every animate and inanimate thing upon the earth. All forms in material things, in process of time, have their births and deaths, and so it must be through all eternity. Man's body dies and returns to the earth; it shoots up into the stately oak or blossoms in the sunflower, and so throughout the universe, change is inherent in every form in space,—it is universal and must be inevitable.





MAY 2 - 1950

5-1

